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Is there any Difference between Revised Indian and WHO BMI Classification? A Study on Male Desk Job Workers

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ABSTRACT

Background: To determine the effect of revised Indian BMI guidelines on the prevalence of obesity in male desk job workers and to analyze cardiovascular risk factor distribution under the revised guidelines.

Method: A retrospective cross-sectional study was carried out utilizing health records of male desk job workers from a week-long onsite medical health screening camp held at two different corporate organization in Chennai, India in 2015. Statistical analysis was done assessing the distribution and association of smoking, hypertension and diabetes across BMI categories based on WHO and revised Indian BMI guidelines, using Pearson's Chi-square test of association at statistical significance of $p<0.05$.

Results: The prevalence of obesity increased from 10.7% based on WHO guideline to 52.7% by revised Indian guideline, translating into one in five male workers being added to the pool of cardiovascular risk. Though the behavioral risk factor of smoking became a significant association with revised Indian BMI guideline in comparison to WHO guideline, the significance of association of hypertension and diabetes with BMI categories was maintained irrespective of the guidelines.

Conclusion: Increase in the number of obese male desk job workers was noted with the revised Indian BMI guideline, with retention of cardiovascular risk factor association with obesity.

Keywords: *BMI, Desk job, Indian, Obesity, WHO, Workplace*

INTRODUCTION

Obesity, a major global public health concern[1,2], has been an established risk factor for various non-communicable diseases including diabetes mellitus, hypertension and cardiovascular diseases [CVD][3-6]. As per 2014 global statistics, based on WHO classification of body mass index (BMI), around 600 million adults were obese (BMI 30 kg/m^2 or more)[7]. In India, an estimated 30-65% of the adult urban population has been reported to be either overweight or obese[8].

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Several studies have reported a higher prevalence of obesity in the workplace, exerting adverse health concerns[9,10]. The higher prevalence of workplace obesity is of significance as an adult spends a substantial time of a day at work. Further obesity has been reported to be associated with an indirect cost at the workplace in the form of reduced productivity, work impairment, increased absenteeism and hence increased health care (direct) cost[9,11-13]. At employee level, obesity may be associated with reduced functionality, increased sickness, diminished quality of life and greater risk of workplace injury, illness and disability[3,12,14,15].

Body Mass Index (BMI) is most commonly used to define obesity in clinics, and large scaled population-based studies, owing to its simplicity, ease of measurement and inexpensiveness[16]. It is expressed in units of weight and height as kilogram per meter square.

A BMI of 30 or more is considered obese as per WHO standards[3] (Table 1). But then the WHO guidelines were reported based on Caucasian white population, thereby limiting its use universally across ethnic groups[17-19]. Hence the BMI standards were revised for Asian Indians[20,21] defining BMI of 25 or more as obese (Table 1). Further studies have also reported gender-based variations in BMI[22,23] with men reported to be at greater risk for developing CVD at a given BMI in comparison to women, regardless of ethnicity[22,23].

Thus, routine workplace health screening using WHO standards may underestimate those at risk of CVD. Hence the aim of this cross-sectional retrospective study is to analyze the influence of the revised BMI guidelines on the obesity prevalence in desk job male workers and to analyze the distribution of hypertension, and diabetes as per the revised BMI.

Additionally, the aim was also to analyze the distribution of smoking as per the revised BMI, as in India, tobacco consumption has been reported mostly in men[24], which may be due to the social and cultural restraints about tobacco usage in women. Further in the last decade, there has been a substantial increase in the number of male smokers with the projected overall tobacco-related mortality being around 13% by 2020[24,25].

MATERIALS & METHOD

A retrospective cross-sectional study was carried out utilizing health records from a week-long onsite medical health screening camp held at two different corporate organization in Chennai, India in 2015. For the current study only male participants were included in the survey. A structured in-person interview was carried out by medical personnel at the camp and data were collected on behavioural-demographic characteristics and medical history including diabetes and hypertension status. Anthropometric measures (weight and height) were measured according to the NHANES Anthropometric Standardization Reference Manual[26]. BMI was then calculated from Quetelet's index (Kg/m^2), and the weight status classified based on WHO and revised Indian guidelines (Table 1).

Table 1: BMI Guidelines – WHO and Indian Standards

Classification	WHO Standards	Indian Standards
Normal Weight	18.5 to <25	18 to <23
Overweight	25 to <30	23 to <25
Obese	≥30	≥25

Strata for the presentation of statistics include age group (under 30, 30 to 49, 50 to 59, or 60 and above years), BMI status (underweight, normal weight, overweight, and obese), smoking status (yes or no), hypertension status (yes or no), and diabetes status (yes or no). Participants who reported current smoking (at least once per month) were defined as smokers, while participants who are on drug therapy for or have self-reported hypertension and diabetes were recorded as having the particular risk factor, irrespective of the laboratory data. The study protocol was approved by the Institutional CSR Review Board and adhered to the tenets of the Declaration of Helsinki.

The statistical analysis was done using IBM SPSS 23.0 software. Descriptive analyzes were conducted to determine the distribution of age, smoking, hypertension, and diabetes in general and across BMI categories. To assess the association of BMI groups with its potential correlates like age, smoking status, diabetes, and hypertension, Pearson's Chi-square test of association was performed, with the statistical significance set at $p<0.05$.

RESULTS

2444 males were identified in the study through health records, with the mean age of 43.5 years (SD=9.8) and mean BMI of 25.4 (SD=3.8). Descriptive statistics is shown in Table 2-4.

Table 2: Descriptive summary of the study participants

Characteristics	Sample Size (%)
Total participants	2444 (100)
Age (in years)	
18-29	237 (9.7)
30-39	634 (25.9)
40-49	770 (31.5)
50-59	772 (31.6)
≥60	31 (13)
Smoking Status	
Smoker	331 (13.5)
Non-Smoker	2113 (86.5)
Diabetes Status	
Diabetics	389 (15.9)
Non-Diabetics	2055 (84.1)
Hypertension Status	
Hypertensives	395 (16.2)
Non-Hypertensives	2049 (83.8)

Results of statistical tests determining the association, based on Pearson's Chi-square test, between age group, diabetes and hypertension status with BMI categories was found to be significant with $p<0.05$, irrespective of the BMI guideline followed. On the other hand, the association between smoking status and WHO BMI guidelines were found to be insignificant ($p>0.05$), while with the revised Indian BMI guideline, the association was found to be significant ($p<0.05$).

Table 3: Distribution based on WHO BMI guidelines [n(%)]

BMI Category	Underweight	Normal Weight	Overweight	Obese
BMI WHO Guidelines				
Sample Size	62 (2.5)	1094 (44.8)	1026 (42)	262 (10.7)
Age in Years				
18-29	17 (7.2)	131 (55.3)	72 (30.4)	17 (7.2)
30-39	20 (3.2)	288 (45.4)	280 (44.2)	46 (7.3)
40-49	10 (1.3)	335 (43.5)	322 (41.8)	103 (13.4)
50-59	15 (1.9)	324 (42)	339 (43.9)	94 (12.2)
≥60	0 (0)	16 (51.6)	13 (41.9)	2 (6.5)
Smoking Status				
Smoker	14 (4.2)	144 (43.5)	136 (41.1)	37 (11.2)
Non-Smoker	48 (2.3)	950 (45)	890 (42.1)	225 (10.6)
Diabetes Status				
Diabetics	1 (0.3)	164 (42.2)	179 (46)	45 (11.6)
Non-Diabetics	61 (3)	930 (45.3)	847 (41.2)	217 (10.6)
Hypertension Status				
Hypertensives	1 (0.3)	138 (34.9)	191 (48.4)	65 (24.8)
Non-Hypertensives	61 (3)	956 (46.7)	835 (40.8)	197 (9.6)

Table 4: Distribution based on Revised Indian BMI guidelines [n(%)]

BMI Category	Underweight	Normal Weight	Overweight	Obese
BMI WHO Guidelines				
Sample Size	41 (1.7)	559 (22.9)	556 (22.7)	1288 (52.7)
Age in Years				
18-29	9 (3.8)	92 (38.8)	47 (19.8)	89 (37.6)
30-39	13 (2.1)	143 (22.6)	152 (24)	326 (51.4)
40-49	8 (1)	145 (18.8)	192 (24.9)	425 (55.2)
50-59	11 (1.4)	168 (21.8)	160 (20.7)	433 (56.1)
≥60	0 (0)	11 (35.5)	5 (16.1)	15 (48.4)
Smoking Status				
Smoker	12 (3.6)	75 (22.7)	71 (21.5)	173 (52.3)
Non-Smoker	29 (1.4)	484 (22.9)	485 (23)	1115 (52.8)
Diabetes Status				
Diabetics	1 (0.3)	77 (19.8)	87 (22.4)	224 (57.6)
Non-Diabetics	40 (1.9)	482 (23.5)	469 (22.8)	1064 (51.8)
Hypertension Status				
Hypertensives	1 (0.3)	56 (14.2)	82 (20.8)	256 (64.8)
Non-Hypertensives	40 (2)	503 (24.5)	474 (23.1)	1032 (50.4)

DISCUSSION

The prevalence of overweight and obese male desk job workers were found to be higher with the revised Indian BMI guidelines in comparison to WHO guidelines while retaining the significant association with cardiovascular risk factors namely hypertension and diabetes. The behavioral risk factor of smoking was found not only to be increased in prevalence, but also to exhibit a significant association with obesity based on revised Indian BMI guidelines. In this study, the revised guideline reduced the number of male desk job workers classified as normal based on WHO guidelines to half (22.9% from 44.8%), thereby substantially increasing the percentage classified obese from 10.7% based on WHO guidelines to 52.7%. Thus, almost one in five male workers was added to the pool of employees at risk for cardiovascular risk factors. Further the percentage of obese individuals being a smoker or having diabetes or hypertension increased by approximately 41%, 46% and 48% respectively based on revised Indian BMI guidelines in comparison to WHO guidelines.

Obesity has been associated with various cardiac and non-cardiac health risks[1,2,15,27] and has been shown to exhibit higher prevalence at the workplace[2,5,9,10]. This association with adverse health outcomes stresses on the need for workplace interventions focusing on prevention and early management. Workplace hence offers a unique opportunity to implement interventions and wellness programs targeting overweight and obese populations at risk of CVD risk[28], and to exert policy changes promoting healthy workforce[29] benefitting both employee and employer improving productivity and bringing down health care expenses[30].

The results of this study can help inform future worksite interventions and wellness programs; however, our study has several limitations. Firstly the study is retrospective with sampling and reporting bias and temporal ambiguity. Secondly, only BMI was used in the current study, while combined use of both BMI and waist circumference have been shown to identify people at CVD risk[20] better. Thirdly, various confounding factors, which may contribute to obesity like environmental, cultural, psychological, economical

and genetical factors[31] weren't accounted for. However, the risk factors weren't studied due to the time-restricted camp setting of the study.

Despite these limitations, the study results provide for potentially actionable information on addressing obesity at worksites taking into consideration the revised Indian BMI guideline. Further research is warranted with the revised guidelines in working Indian population to determine the direction and strength of associations with behavioral and cardiovascular risk factors, and workplace illness, injury and disability.

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Conflict of Interest: None

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Ethical Clearnace: The study was approved by the CSR Ethics committee at Apollo Hospitals, Chennai.

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Dermatophytosis in a Tertiary Care Teaching Hospital of Odisha: A Study of 100 Cases of Superficial Fungal Skin Infection

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ABSTRACT

Introduction: Dermatophytosis is common superficial fungal infection of the skin. Recurrent dermatophytosis has become a troublesome entity in a tropical country like India and also carries a great psychosocial problem. The present study was undertaken with the aim to isolate and identify different species of dermatophyte and to study their clinical pattern.

Materials and Method: The study was conducted in a tertiary care teaching hospital over a period of 1 year taking 100 cases of suspected superficial fungal skin infection. Isolation and identification of causative species was done by various methods like macroscopic, microscopic, culture and biochemical tests.

Results: The present study found Tinea corporis to be the commonest clinical type with 45 cases (45%) followed by Tinea cruris 31cases (31%). Out of 100 cases males were more in number 58(58%) compared to female 42(42%). Out of 100 cases which were subjected for KOH mount, 57 cases were positive and 43 cases were negative for fungal elements on direct microscopy. Culture was positive in 47 cases which included 42 KOH positive cases and 05 KOH negative cases. Trichophyton rubrum was the commonest isolate in 70.21% of isolates.

Conclusion: This study highlighted that Tinea corporis is the commonest clinical type with *Trichophyton rubrum* as the most common aetiological agents and males are more frequently affected. Though various species of dermatophytes produce clinically different characteristic lesions, but a single species may produce various types of lesions depending upon site of Infection.

Keywords: *Tinea, Trichophyton, Dermatophytes, Dermatophytosis*

INTRODUCTION

Dermatophytosis is a common superficial fungal infection of skin. Dermatophytosis is generally called as "Tinea" which is a Latin word for "ring worm". The second part of the name of the dermatophytosis identifies the part of the body infected[1]. Tinea corporis and tinea cruris are the common types of dermatophytic skin infection. Dermatophytes are aerobic fungi that produce proteases that digest keratin and allow colonization, invasion and infection of the stratum corneum of the skin, the hair shaft, and the nail. Dermatophytosis is more prevalent in tropical and subtropical countries including India, where heat and moisture play an important role in promoting the growth of these fungi. In India which is a tropical country, the cause of dermatophytosis is adversely influenced by economic factors like poverty, poor hygiene and social conditions like overcrowding. Nature of dermatophytosis may change with passage of time,

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living population, evolution of preventive measures and hygienic conditions in society. *Trichophyton rubrum* is the predominant isolate in most clinical types. Infection is generally cutaneous and restricted to the nonliving cornified layers because the fungi is not able to penetrate the deeper tissue or organ of healthy immunocompetent host. The degree of immunosuppression and the number of immunosuppressed patients are increasing at an unprecedented pace, the management of dermatophytosis would be a definite challenge to mankind in the years to come. Dermatophytic infections are of major importance, as they are widespread and cause discomfort. Reactions to dermatophyte infection may range from mild to severe. The mildness and severity depend on a variety of factors such as the host reactions to the metabolic products of the fungus, the virulence of infecting species or particular strain, anatomical location of the infection and local environmental factors[2]. Since these infections are often confused with other skin disorders, it is therefore, necessary to make early laboratory diagnosis for better management of these conditions[3]. The present study was undertaken with a aim to find out the incidence of dermatophytosis and species prevalence in clinically suspected cases of dermatophytosis in this part of our state.

MATERIALS & METHOD

This study was undertaken taking 100 clinically suspected patients having dermatophytosis randomly selected from the Dermatology outpatient department of Institute of Medical Sciences & SUM Hospital, Bhubaneswar from July 2014 to June 2015. Clinical history including age, sex, socioeconomic status, occupation, duration of disease, history of recurrence and type of lesion, similar complaints in the family and contacts with animals or soil were elicited and recorded in all cases. General physical examination and systemic examination was conducted and investigations like hemoglobin, total count, differential count, blood sugar, and liver function test were done whenever necessary. Infants, patients above 60 years, immunocompromised patients, secondarily infected, and those who have taken other modality of treatment like steroid were excluded from the study. Samples were collected after cleaning the affected surface with 70% alcohol. From skin lesions, scales were collected from erythematous growing margins of the lesion with a sterile blunt scalpel. Samples were collected in sterilized Whatman filter paper envelope and transported to the microbiological laboratory. Material was subjected to direct microscopic examination using 10% KOH. Two sets of medium were used. Sabourauds dextrose agar (modified) and Sabourauds dextrose agar with cycloheximide and chloramphenicol were incorporated to avoid contamination with saprophytic fungi and bacteria. The clinical material were inoculated into one each of the above two media. The inoculated agar slants were incubated in room temperature and at 37ºC in incubator and observed daily for growth. If no growth was noticed by four weeks culture was considered negative and discarded. Slide culture was done to study the morphology of microconidia and macroconidia, nature of the sporulation, special structures such as spirals, pectinate, racquet hyphae, and chlamydospores. Special tests were performed when necessary for species identification.

RESULTS

A total of 100 patients were taken in the study, out of which 58 were males and 42 females. Maximum numbers of cases were in the age groups of 14 - 40 years (49 cases). The youngest patient was a 9-year-old girl and the eldest was a 60-year-old man. From this study it was seen that dermatophytosis was more common in males (58%) than in females (42%).Table 1.

Table 1. Age & sex distribution of dermatophytosis

Age in years	Male	Female	Total
1 – 10	04	03	07
11 – 20	09	06	15
21 – 30	14	08	22
31 – 40	10	12	24
41 – 50	12	07	19
51 – 60	09	04	13
Total	**58**	**42**	**100**

Tinea corporis was found to be the commonest clinical presentation with 45 cases followed by tinea cruris and tinea pedis with 31 and 12 cases respectively. Tinea capitis was mostly observed in children and girls were predominantly affected than boys (Fig 1, Table 2).

Table 2. Clinical types of dermatophytosis

Clinical type	No of cases	Percentage
Tinea corporis	45	45
Tinea cruris	31	31
Tinea pedis	12	12
Tinea capitis	07	07
Tinea mannum	03	03
Tinea faceie	02	02

Table 3. Results of KOH and culture

	KOH positive	KOH negative	Total
Culture positive	42	05	47
Culture negative	15	38	53
Total	57	43	100

Fig 1 Clinical types of dermatophytes

Fungal elements by KOH mount were observed in 57 cases and culture was positive in 47 cases.

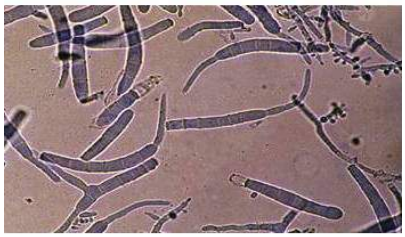
Out of 57 KOH positive cases 42(73.68%) yielded growth in culture. Among 43 KOH negative cases, 5(11.62%) were culture positive. Thirty-eight cases were negative by both KOH mount and culture. Table 3.

From the culture positive cases the commonest species isolated was Trichophyton rubrum with 33(70.21%) followed by Trichophyton mentagrophytes with 12(25.53%) and Epidermophyton floccosum with 2(4.26%) (Table 4, Fit 2).

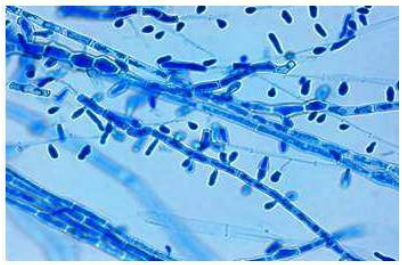
Table 4. Isolation of various species

Causative species	No of isolates	Percentage (%)
Trichophyton rubrum	33	70.21
Trichophyton mentagrophytes	12	25.53
Epidermophyton floccosum	02	04.26
Total	**47**	**100**

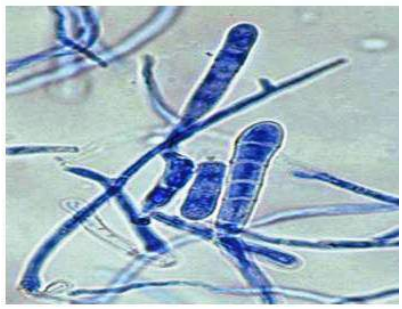
From the clinical types T. rubrum was isolated from 18 cases of tinea corporis followed by 10 cases of tinea cruris. T. mentagrophytes was isolated from equal number of 5 cases of tinea corporis and tinea cruris. Epidermophyton floccosum was isolated from 2 cases one each from tinea corporis and tinea capitis. Tinea pedis cases showed 2 isolates each of T. rubrum and T. mentagrophytes and one case of tinea mannum showed T. rubrum species. Table 5.



Trichophyton rubrum



Trichophyton mentagrophytes



Epidermophyton floccosum

Fig 2 Microscopic view of dermatophytes with cotton blue staining

Table 5. Causative species in different clinical types of tinea

Species	T. corporis	T. cruris	T. pedis	T. capitis	T. mannum
Trichophyton rubrum	18	10	02	01	01
Trichophyton mentagrophytes	05	05	02	00	00
Epidermophyton floccosum	01	00	00	01	00
Total	**24**	**15**	**04**	**02**	**02**

DISCUSSION

In the present study of 100 cases, highest incidence of dermatophytosis was observed in the age group of 14–40years and in males. This may be due to greater outdoor physical activity and increased sweating in this age group favoring the growth of dermatophytes. This was in correlation with other studies[4,5]. From the study following clinical forms were observed: tinea corporis, tinea cruris, tinea pedis, tinea capitis, tinea mannum and tinea faciei of which tinea corporis was the commonest form which is in line with other studies done by Bindu *et al* and Belukar *et al*. [6,7] However in the studies by Verma *et al*. [8]and. Sardari *et al*.[9] it has been reported that tinea cruris was the most common clinical type but in our study tinea corporis was common in comparison with tinea cruris. Tinea capitis was more common in girl children below the age group of 12 years, which was also observed in some other studies[10,11]. In another study of superficial mycosis in a hospital in north-east India it was observed that tinea pedis (29.2%) as the most common dermatophytosis followed by tinea cruris (26.2%), which differs from other studies[12] Out of 100 cases which were subjected for KOH mount, 57 cases were positive and 43 cases were negative for fungal elements on direct microscopy. Culture was positive in 47 cases which included 42 KOH positive cases and 05 KOH negative cases. Similar type of observation was also made in some other studies[13]. However, a study by Belukar *et al*[7]. showed culture positivity of 71%, which was much higher and a study done at Aurangabad showed low rate of culture positivity of 22.8% [14]. *Trichophyton rubrum* was the main organism isolated with a percentage of 70.2%. This is similar to reports of other workers from different regions of India. *Trichophyton mentagrophytes* (25.5%) isolates were found second in frequency similar to the study from Calicut by Bindu *et al*, which are relatively more prevalent in south India. *E. floccosum* was the most common etiological agent of dermatophytosis in a study by Pashkir at Karaj city, Tehran[15]. However, in the study by Grover *et al*[12]. in north-east India *T. tonsurans* was the most common dermatophyte followed by *T. rubrum*, which differs from other studies that reports *T. rubrum* as the most common fungal pathogen. In the present study E.floccosum was isolated in 4.3% of cases which was similar to findings of other studies of 8.49% by Kumas S *et al*. in 2014[16], Singh S et al in 2003 reported - 7.75% [5] and Peerapur BV et al in 2004 – 7.8% [17]and Gupta BK in 1993 – 15.15%.[18] Although Dermatophytosis is caused by all three i.e. *Trichophyton, Epidermophyton* and *Microsporum* but our study did not isolate *Microsporum*

as causative agent in any of the patients which was also corroborated in other studies by Poluri et al in 2015 and Bindu et al in 2002 [2,6] and studies by Parameswari et al isolated *Microsporum gypsum* as causative agent in 4.3% cases of dermatophytosis.[19] In most of the inflammatory lesions *T. mentagrophytes* was isolated and *T. rubrum* was isolated in most of the non inflammatory lesions. Other significant finding from the study was that most of the patients were of low socioeconomic status and close family members of patients were also affected.

CONCLUSION

Dermatophytosis is a very common problem encountered in a tropical country like India and outdoor physical activities which causes excessive sweating is a major aggravating factor in these patients. However this can be tackled with patient education about maintaining a good personal hygiene. Even though dermatophytosis is a trivial disease but it is associated with lot of psychological effects especially in recurrent cases. Early diagnosis and treatment is the key in tackling the menace and also preventing in lot of expenditure in the treatment.

Ethical Clearance: This study is approved from our institutional ethics committee.

Source of Funding: Self

Conflict of Interest: Nil

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Evaluation of Deferral Pattern among Blood Donor Population in a Hilly Terrain of Solan Region, North India

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ABSTRACT

Introduction: Safe donors are encouraged to donate their blood while at-risk donors are encouraged to self defer from blood donation. The purpose of present study was to evaluate deferral pattern among blood donor population in the hilly terrain of Solan region, North India.

Materials and Method: The present study was conducted to analyse the retrospective data for various causes of deferral of whole blood donors over a period of one year, from June 2015 to May 2016, among different age groups of both the sex at the Department of Transfusion Medicine, Maharishi Markandeshwar Medical College and Hospital, Solan

Results: Out of 2195 whole blood donors, 105 (4.78%) were deferred. Most common cause of temporary deferral was Low Hemoglobin (17.58%) followed by antibiotics intake (14.23%), alcohol intake (13.19%), jaundice (10.9 %) and typhoid (8.79 %). The most common cause of permanent deferral was Hypertension (57.14%) and Asthma (14.28%).

Conclusion: A deferral study in blood donors sheds light on the health status of the general population that affect the blood supply.

Keywords: *Donor deferral, Transfusion Medicine, temporary deferral, permanent deferral*

INTRODUCTION

Safe blood inventory is a challenging job especially in developing countries. According to World Health Organization factsheet 2017, around 112.5 million blood donations are collected worldwide and more than half of these are collected from high-income countries having population of only 19 percent and the median annual donations per blood centre is 5400 in the low and middle-income countries in contrast to 16000 in the high-income countries.[1] Blood donor has to pass through stringent donor selection criteria and screening, and many of them get deferred due to various reasons.[2] Donor screening and donor deferral are important for the supply of safe blood as regular transfusion transmitted infection screening is done for only five infections and other diseased conditions can be identified at the time of donor screening. Sometimes the deferred donors feel de-motivated and have negative experience in blood donation thus preventing them to become regular voluntary donors.[3] Deferred donors can be divided into temporary or permanent deferrals and it is the temporary deferrals which add to the larger pool of deferrals. So it is very important to recognize, counsel and motivate prospective temporary deferred donors, so that they can become regular voluntary donors in future. Most of the donor deferral studies are done in plain regions of India. The aim of our study was to evaluate deferral pattern among donor population in a hilly terrain in northern part of India.

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MATERIAL AND METHOD

A retrospective study was conducted on Whole blood donors to evaluate the various causes of Deferral, over a period of one year, from June 2015 to May 2016. The study was approved by the institutional ethics committee. The donors were screened through donor questionnaire followed by physical examination and hemoglobin estimation. The deferred donor's data was then collected according to the criteria laid down by the Directorate General of Health Services guidelines, Ministry of Health and Family Welfare (2003).[4] Deferred donors data was then analysed and was categorised into permanent and temporary causes. The deferred donor's data thus collected was calculated and analysed statistically using SPSS software.

RESULTS

Out of 2195 whole blood donors who were screened, 2090 (95.22%) were eligible for donation and 105 (4.78%) were deferred. The deferral rate among male population was 3.97% and female population was 11.84%. (Table 1). Out of the total 105 deferred donors, 91 (86.67%) donors were deferred because of temporary reasons whereas 14 (13.33%) donors were deferred because of permanent reasons (Table 2).

Table 1: Distribution of Male and Female Whole Blood Donors

Donor Category	Male	Female	Total
Total Selected Donors	1889 (96.03%)	201 (88.16%)	**2090 (95.22%)**
Total Deferred Donors	78 (3.97%)	27 (11.84%)	**105 (4.78%)**
Total Registered Donors	1967 (100%)	228 (100%)	2195 (100%)

The most common cause of temporary deferral was Low Hemoglobin (17.58%) followed by antibiotics intake (14.3%), alcohol intake (13.19%), jaundice (10.9 %) and typhoid (8.79 %) (Table 3). The most common cause of permanent deferral was Hypertension (57.14%) followed by Asthma (14.28%) (Table 4).

Table 2: Frequency of Permanent and Temporary Deferrals.

Type of Deferral	No. of Deferrals	Total deferrals (%)	Deferrals of total registration (%)
Temporary	91	86.67 %	4.15 %
Permanent	14	13.33 %	0.63 %
Total Deferrals	**105**	**100%**	**4.78 %**

The various causes of temporary and permanent deferrals along with their relative proportions are shown in Table 3 and Table 4 respectively.

Table 3: Causes of temporary deferrals with their relative proportions

Temporary Deferrals	**18-29**		**30-41**		**42-53**		**54-65**		**Total Male**	**Total Female**	**Grand Total**
Cause	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**			
Low Hemoglobin	1	8	2	2	0	2	0	1	3	13	16(17.6%)
Alcohol intake	4	0	8	0	0	0	0	0	12	0	12(13.2%)
Antibiotics	7	0	4	0	2	0	0	0	13	0	13(14.3%)
Hypotension	1	1	0	1	0	0	0	0	1	2	3(3.3%)
Underweight	0	2	0	2	0	1	0	0	0	5	5(5.5%)
Typhoid	3	1	3	0	1	0	0	0	7	1	8(8.8%)
Jaundice	4	0	4	0	0	1	1	0	9	1	10(11%)
Dogbite	0	0	2	0	0	0	0	0	2	0	2(2.2%)
Previous Donation	3	0	1	0	0	0	0	0	4	0	4(4.3%)
Tatoo	1	0	1	0	0	0	0	0	2	0	2(2.2%)
On ATT intake	1	0	1	0	0	0	0	0	2	0	2(2.2%)
Fever	0	0	4	0	0	0	0	0	4	0	4(4.3%)
Allergic Disease	1	0	0	0	1	0	0	0	2	0	2(2.2%)
Dengue	0	0	1	0	0	0	0	0	1	0	1(1.1%)
Malaria	1	0	0	0	0	0	0	0	1	0	1(1.1%)
Abortion	0	0	0	1	0	0	0	0	0	1	1(1.1%)
Lactation/Recentdelivery	0	0	0	1	0	0	0	0	0	1	1(1.1%)
Poor vein	0	1	0	0	0	0	0	0	0	1	1(1.1%)
Recent surgery	1	1	0	0	1	0	0	0	2	1	3(3.3%)
Total	28	14	31	7	5	4	1	1	65	26	91(100%)

Table 4: Causes of permanent deferrals with their relative proportions

Permanent Deferrals	18-29 Yrs		30-41 Yrs		42-53 Yrs		54-65 Yrs		Total Male	Total Female	Grand Total
Cause	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**			
Hypertension	0	0	4	0	4	0	0	0	8	0	8(57.14%)
Malignancy	0	0	0	0	0	1	0	0	0	1	1(7.14%)
Heart Disease	0	0	0	0	0	0	1	0	1	0	1(7.14%)
Diabetic	0	0	0	0	1	0	0	0	1	0	1(7.14%)
Asthma	0	0	1	0	1	0	0	0	2	0	2(14.30%)
Epilepsy	0	0	1	0	0	0	0	0	1	0	1(7.14%)
Total	0	0	6	0	6	1	1	0	13	1	14(100%)

DISCUSSION

Healthy and safe donor selection is the first and important step towards safe transfusion services. This is achieved through proper donor counseling and screening questionnaire before donation and is an important process to recruit and retain regular voluntary non remunerated donors. The pattern of donor deferral is an important tool for blood safety and also provides key areas to focus on a region or policy formulation nationally for donor selection as well ensure donor safety.[5]

Our study focused on various blood donor deferral patterns amongst the population of hill region of Solan district as this region lacked any such previous study. In the present study the overall total donor deferral rate was 4.78% (105/2195) which was similar to studies conducted in New Delhi (North India) and South India whose total donor deferral rates were 5.1% and 5.04% respectively.[6,7] However, in studies conducted in Central, Eastern and Western India deferral rates were considerably higher than our study (11.5%, 9.7% and 33%).[5,8,9] This emphasizes the need for region wise donor deferral studies in order to establish region wise deferral criterias in our country. In this study total donor deferral rate among females was three times higher than the males (11.84 % vs 3.97%) and there was a statistically significant difference between between the two ($p < 0.05$). This was similar to other studies conducted in North, South and Eastern and Western India.[6,7,8,10] Temporary reasons were the commonest cause of deferrals amongst the total donors deferred in current study (86.67%) which was analogous to studies by Shrivastava et al (62.8%)[5], Pisudde et al (77.8%)[8], Vimal et al (78.7%)[11], Kasraian et al (95.5%)[12] and Chauhan et al (95.16%).[13] The majority of temporarily deferred donors were <41 years of age (80/91 i.e. 87.91%) comparable to the Western Indian study (80.80% <40 years).[9] Contrastingly, majority of permanently deferred donors were >41 years (8/14 i.e. 57.14%). Agnihotri also found that deferral percentage increased significantly as the age of the donor increased to >40 years.[10] However, our study could not find any statistically significant association between age of temporary deferrals. On the contrary, there was a highly statistically significant association between temporary deferral and gender ($p<0.001$) that was similar to the significant female preponderance among temporary deferred donors in Western Indian study i.e. in present study, 11.40% of total female and 3.30% of total male donors were deferred temporarily similar to 15.05% female vs. 2.51% male donors deferred temporarily in Western Indian study.[9]

Low hemoglobin (<12.5g%) was the commonest cause of temporary deferrals in our study which was similar to many studies but the total percentage of temporary deferrals due to low hemoglobin was much lower in comparison to many studies. Low hemoglobin constituted only 17.6% (16/91) of the Temporary causes of deferrals and only 15.23% (16/105) of all causes of Deferral. This was totally different from most of studies including those by Pisudde et al[8], Shah et al[9], Agnihotri[10], Vimal et al[11] and Chauhan et al[13] in which Low hemoglobin constituted 52.6%, 78.3%, 55.8%, 31.5% and 42.26% of the total temporary deferrals respectively. However, our overall total rate of low hemoglobin deferral of 15.23% was closest to Shrivastava et al who also found 19.4% donor deferral due to low hemoglobin.[5] This observation of Less temporary as well as Total deferral percentage due to low hemoglobin may be explained by the fact that in the Hill State of Himachal Pradesh hemoglobin in people is higher as an adaptation to higher altitude. This finding

is corroborated by the National Family Health Survey 2015-16 in which only 20.1% men age 15-49 years are anaemic (<13.0 g/dl) in the state of Himachal Pradesh.[14] Bharati et al also stated that Women from Himachal Pradesh were less anemic (32.2%) compared with those from other states in India and mean hemoglobin in Women was 12.47 g%.[15] Therefore, in our study also although low hemoglobin was a commonest cause of blood donor deferral in Females but overall it constituted less than 50% of the total deferrals. The commonest cause of Permanent Deferrals was Hypertension which was akin to most studies.[7,8,10,11,13]

CONCLUSION

A shortage of safe blood donors is frequent and it is important to understand the causes of deferral of potential donors to improve recruitment campaigns aiming at the quality and availability of donors. A deferral study in blood donors not only sheds light on the health status of the general population that affect the blood supply but also gives diverse region wise donor deferral data emphasising the need for region centric donor deferral studies. As temporary deferrals are higher than permanent deferrals, they should be appropriately counselled, educated and encouraged for repeat donation which can compensate the ever increasing demand of Healthy blood donors.

Source of Funding : None

Conflicts of Interest – Nil

Ethical Clearance: Taken from the Ethical Committee.

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Evaluating the Impact of HR Practices on Employee Deviant Behavior: An Exploratory Study on Employees of IT Industry

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ABSTRACT

Purpose – The purpose of this study is to evaluate the impact of Human Resource Practices on Workplace Deviance. Given the paucity of existing research on the role of HR practices in shaping workplace deviance, the present study aimed to explore the issue further specifically by extending the work through consideration of broader types of deviant behavior possibly exhibited by employees at work.

Design– This article analyses the link between Organization HR Practices and Employee workplace deviance. Toward this objective, a survey was carried out among 372 IT employees in the Southern region of India. Factor analysis revealed four distinct dimensions of HR practices i.e. job description, employment security, internal career opportunities, and result-oriented appraisal.

Findings – Deviant workplace behavior resulted in one dimension only, i.e. interpersonal deviance. Multiple regression analysis shows that all dimensions of HR practices but result-oriented appraisal were found to influence negatively organizational deviance.

Originality– Till date, an attempt was never made to link the HR Practises and Workplace Deviance of IT employees. Therefore this article would be valuable to the researchers and academicians who wish to acquire a paradigm of the present writing, particularly pursuers who don't have practical experience in the branch of knowledge. The

Present study has been able to provide initial understanding on the issue of workplace deviance and the determining role of HR practices.

Keywords *–HR Practices, Workplace Deviance, Organisational behavior, IT employees, India.*

INTRODUCTION

Deviant work behavior refers to voluntary behavior that violates significant organizational norms. And, in thus doing, so is perceived as threatening the nicely-being of the firm and its contributors [1]. Examples of such behavior are coming back in overdue to figure without earlier permission, stealing organization Belongings, and harassing others at work. Attributable to the nature of its negativity, the topic has step by step gained attention every of academics and practitioners. In effect, analysis on the matter is step by step increasing with emphasis given on analyzing the contribute factors. However, upon assessment of the literature, little is recognized of the role of Human Resource (HR) practices on deviant work behavior, in spite of the existing evidence at the result of such practices on shaping worker attitudes and behavior consisting of structure Dedication, method satisfaction, and task overall performance [2], [3], [4], [5].

To date, an attempt became created to link human resource practices with deviant behavior [6]. The usage of statistics from a nationally representative survey of over 300 US Work establishments, Arthur set empirical support that companies with HR structures defined with the help of bigger use of internal diligence markets and far less crew autonomy are related to decrease frequencies of advised social deviance behaviors. At identical time as his work is ready to shed some insight

into the perform of HR practices on deviant behavior, it become finished on the organizational stage of analysis, and targeted on a specific sort of deviant conduct best. Such an affected cognizance is unlucky as personnel are expressed to own interaction in varied styles of deviant behavior at work and Research are required to appear at why they act in such dangerous behaviors [1], [7]. An observe at the gender level analysis of research is bonded as deviant behaviors are committed by method of people at intervals the Organization, and it's miles apt to know however the HR practices applied might want to create their notion on this issue.

Given the scarceness of existing studies on the role of HR practices in shaping place of work deviance, the Present study aimed to get the problem any.

METHOD

Study Sample and Procedure

To achieve the analysis objective explicit earlier, a survey was applied amongst producing employees of varied service levels in IT corporations in India.

Questionnaires were distributed with the help of human resource departments. As a result of this method of distributing the questionnaires might compromise the honest opinions of the participants, the researchers guaranteed their obscurity. They were additionally told that the finished questionnaires ought to be sealed in an accompanying envelope before returning to the human resource department for assortment, which their responses would be collective. The survey took about twenty minutes to finish.

All in all, four hundred self-reported questionnaires were distributed to the staff. Once 3 months of knowledge collection from October 2017 till December 2017, 372 completed questionnaires were came either by mail or by personal assortment, yielding a decent response rate of ninety three. All came questionnaires were valid for final knowledge analysis. The participants of the study were principally created of male (74.7%), married (62.5%), of Indian origin (90.8%), and had high school diploma or certificate (82.8%). Most of them were non-executive workers (73.1%). The mean age was 30.79 years, and therefore the mean length of service was 6.97 years.

Measures

Deviant work behavior was measured using the work Deviance questionnaire developed by Bennett and Robinson [1]. The 17-item instrument has been widely used in previous studies (e.g. [8], [9]), and have re-portable re-liabilities starting from .74 to .94 [10]. Deviant workplace behavior is categorized into 2 groups: social deviance and structure deviance. Social deviance is characterized by norm-violating behaviors directed at co-workers, whereas structure deviance refers to those counter normative behaviors aimed specifically at the organization itself [11]. Out of seventeen things, seven measured interpersonal deviance, and therefore the remaining things structure deviance. Participants were asked to point, while within the job, however typically they apprehend of any of their workmates, who, for instance, "Made fun of somebody (other workmates, guests, etc.) whereas at work," "Took property from work while not permission," "Came in late to figure while not permission," and "Dragged out add order to induce overtime." The variable was measured on five-point scale, starting from '1' "never," to '5' "all the time."

HR practices were measured mistreatment an instrument containing twenty three things [12]. All things used a five point scale starting from '1' "strongly disagree" to '5' "strongly agree". Participants were asked to point their level of agreement (or disagreement) with regards to the human resource practices in their organization on things like "Employees during this job can usually bear coaching programs each few years," "Performance appraisals are supported objective, quantitative results" and "Job security is nearly warranted to workers during this job."

FINDINGS

Before testing the impact of HR practices on workplace deviance, an element analysis with principle component analysis using an orthogonal varimax rotation was allotted to determine the validity of the measures. To spot and interpret factors, the factors that every item ought to load .50 or bigger on one issue and .35 or lower on the opposite issue were used [13]. Supported the analysis, a four issue answer that designates 67.9% variance in hour practices was found. The Kaiser-Meyer-Olkin (KMO) line of sampling adequacy was .841 whereas the Bartlett's take a look at of sphericalness was important ($\chi 2 = 1544.494$, $p < .01$), indicating sufficient inter-correlations for the correlational analysis. The four factors found are description, employment

security, result-oriented appraisal, and internal career opportunities. Every issue was treated as distinct variables to be thought-about as inputs for correlation analysis later.

Next, cor-relational analysis with varimax rotation was run to validate the spatial property of deviant work Behavior. Unexpectedly, one issue answer explaining 68.7% variance was found. The Kaiser-Meyer-Olkin (KMO) line of sampling adequacy was .832 whereas the Bartlett's take a look at of globularness was significant ($\chi 2 = 1055.942$, $p < .01$), indicating decent intercorrelations for the correlational analysis. As a result of the items that were loaded on one issue replicate deviance targeted at people; this issue was re-labelled interpersonal deviance that was later thought-about within the multivariate analysis.

Table one presents that, internal reliableness worth (Cronbach α), and therefore the correlations of the variables. The Cronbach's alphas obtained for the measures were .84 for job description, .67 employment security, .86 appraisal, .63 internal career opportunities, and .89 work deviances. Supported the table, it seems that in general participants reportable that human resource practices are being well practiced in their organizations, as indicated by the high mean values. Obviously, staffs were reportable to have interaction in work deviance sometimes within the surveyed organizations.

Table-1: Means, Reliability and Correlations (N=372)

Variables	Mean	1	2	3	4	5	Cronbach's α
1.Job Description	3.52	-					0.84
2.Employment Security	3.29	.432**	-				0.67
3.Results oriented appraisal	3.48	.447**	.338**	-			0.86
4.Internal Career opportunities	3.32	.448**	.389**	.352**	-		0.63
5.Workplace Deviance	2.23	-.226**	-.156**	-.103*	-.130*	-	0.89

* Significant at p<.05; ** Significant at p<0.01

As shown in Table-1, all dimensions of HR practices showed important negative correlations with workplace deviance, although the strength of the associations is quite weak [14].

RESULTS

The present study wanted to look at the connection between HR practices and work deviance because very little is thought of whether or not HR practices play a job in shaping employees' deviant responses at work. Based on correlation analyses run, this study has provided empirical support for such relationship. As expected, HR practices are negatively associated with work deviance. Once staff understands that the organization isn't implementing HR practices favourably, they have a tendency to have interaction in deviant behavior at work such as by creating fun of somebody (other workmates, guests, etc.), speech communication one thing hurtful, making an ethnic, non-secular or racial remark, utter somebody, and taking part in a mean prank on somebody. The finding is consistent with previous study that found the impact of HR system on social deviance at the organization level [6].

Specifically, this study found that job description, employment security, result-oriented appraisal, and internal career opportunities are negatively associated with work deviance. Once the workers have duties that are clearly outlined and have up-to-date job description, they're less seemingly to have interaction in deviant behaviors at work as a result of the grasp what to try and do and the way to try and do therefore. It absolutely was reportable that once staff was not further from their role at work, they might feel stressed and should interact in deviant behavior at work [15]. While work stress has been found to be a precursor to work deviance, a lot of studies

ought to be conducted to verify its impact.

As expected, employment security was found to relate negatively to deviant behavior. Employment security is a very important aspect of quality of life for several staff [16]. Once folks feel that their job is secure, they'll be a lot of committed and impelled to table-1 and fewer seemingly to have interaction in deviant behavior. Conversely, those that feel that their job is insecure would tend to be angry and annoyed [17].

To vent anger, they'll divert their negative emotions toward others. Despite the plausible role of emotional responses to job insecurity, a lot of studies ought to be distributed to validate it. Unfavourable appraisal system and lack of internal career opportunities may additionally increase the likelihood of staff partaking in work deviance behavior. Appraisal system is one amongst the foremost problematic HR practices because it is replete with human perspicacity and discretion, despite makes an attempt to minimize such biases. As a result, staff could understand to be below the belt assessed and once this happens they may retaliate by partaking deviant behavior at work [18]. Once the appraisal method is seen as being unfair, the distribution of reward like promotion also will be seen as unfair [19]. While the reason for the connection between HR practices and deviant behavior is probably going, a lot of analysis is required to validate it. Moreover, considering the emotional method like anger or frustration into the equation could facilitate understand the entire relationship higher and therefore extend the present literature on workplace deviance.

The findings of this study recommend that managers ought to confirm that HR practices are

Implemented in such some way that they might not end in unwitting, undesirable activity consequences at work. Perspective surveys, for instance, may be accustomed gauge to what extent the HR practices are perceived to be honest and favourable. To additional extend the literature, a lot of studies ought to be distributed to grasp the issue higher by investigation different factors, like individual, discourse and job-related, and that may contribute to work deviance.

The unidimensionality found of work deviance additionally warrants additional analysis into the re-examination of the size and therefore the issue additional. If so similar findings may be replicated, problems arise on why social deviance solely is exhibited at work and not structure deviance. Such investigation is important because it has vital implications to developing tributary work surroundings.

One of the restrictions of this study is generalizability. Because the participants of this study were from Technology organisation, the findings might not be generalized to a way broader population in other structure contexts owing to the various cultures and values. Moreover, as a result of this study is correlational in nature, causative relationships between the variables are tough to establish. Notwithstanding, despite these limitations, this study has been ready to offer initial understanding on the difficulty of workplace deviance and therefore the determinant role of HR practices.

Ethical Clearance- it as not applicable

Source of Funding- Self

Conflict of Interest - Nil

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Role of Physical Activity in Management of Musculoskeletal Disorders: An Association with BMI

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ABSTRACT

Background & Objectives: Musculoskeletal disorders are usually the health isssues that hinders one's working capabilities. It is the main reason for the absence from work for the emplyoees due to pain and discomfort. It is very important to search for the risk factors of such problems and to look for the preventive measures to solve the issue. There are many factors mentioned in current literature which cause these disorders and body mass index being one of them. The overall performance of an individual is enhanced by taking part in the regular physical activity.

Method: A convenient sample of 30 IT professionals suffering from various musculoskeletal disorders constituted the study sample. The subjects were in the age range of 25 – 40 years with mean BMI range (19 to 25). The minimum hours spent daily working on computer were 5 hours. Subjects were divided into three groups, group A: normal weight (BMI 18.6 - 24.9), group B: overweight (BMI 25.0 - 29.9), group C: obese (BMI 30.0 or more).

Results: The data analysis was done using SPSS software. The paired t test showed significant improvement in normal weight individuals and non-significant improvement in overweight and obese individuals. BMI is in correlation to the level of physical activity.

Conclusion: The present study emphasizes the role of exercises in decreasing the discomfort and pain due to musculoskeletal system disorders. BMI is a crucial factor well associated with these disorders. It is highly advised for the professionals working for long hours to incorporate active lifestyle to decrease the risk factors leading to faulty postures and various musculoskeletal disorders.

Keywords: *Musculoskeletal pain, body mass index, physical activity.*

INTRODUCTION

Musculoskeletal disorders are usually the health isssues that hinders one's working capabilities. It is the main reason for the absence from work for the emplyoees due to pain and discomfort. It is very important to search for the risk factors of such problems and to look for the preventive measures to solve the issue.[1,2] There are many factors mentioned in current literature which cause these disorders and body mass index being one of them.[3] Body mass index is termed as the body mass of an individual divided by the square of his height and is basically expressed in the units of kg/m^2 which is widely applied as the primary tool to estimate to rule out health illnesses in a person due to being overweight or obese. The body mass index is further categorized as underweight (BMI below 18.5), normal weight (BMI 18.5 to 24.9) and overweight (BMI 25.0 to 29.9). [4] Individual with high BMI are at high risk for the advancement of musculoskeletal disorders.[1] Studies recommend that people need to change ther eating regimen and reduce their weight inorder to reduce the musculoskeletal disorders. [3,5] These disorders lower the

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general well being status and it increases sorrow, tension, touchiness, poor social communications, and lower general wellbeing status of an individual .[6 7] The major concern of public health these days being the decreased level of regular physical activity and sedentary life style. Less physical activity is related with the many health conditions and causes risk of many types of systemic diseases. Additionally, the overall performance as well as the cardiorespiratory wellness of an individual is enhanced by taking part in the regular physical activity.[8] Various researches have studied and attempted to make an instructive program which will prevent the disorders by advocationg preventive measures that are conservative and effective in decreasing the incidence of musculoskeletal disorders.[9,10] It has also been emphasized that adopting the correct posture and active lifestyle habits will decrease the prevalance of these disorders.[11,12]

METHODOLOGY

A convenient sample of 30 IT professionals suffering from various musculoskeletal disorders constituted the study sample. The subjects were in the age range of 25 – 40 years. The minimum hours spent working daily on computer were 5 hours. The patients with nerve root compression, disc herniation, severe scoliosis, recent history of any spinal surgery, any neurological disorder, recent fractures, severe systemic disease were excluded. Subjects were divided into three groups, group A: normal weight (BMI 18.6 - 24.9), group B: overweight (BMI 25.0 - 29.9), group C: obese (BMI 30.0 or more). An informed consent was obtained from all the participants and the purpose of the study was explained. The standard nordic questionnaire was administered to assess the musculoskeletal disorders in the participants. The most prevalent areas for pain and discomfort included the low back for majority of the sample. Pain was evaluated through short form McGill pain questionnaire[13] and the level of physical activity through short form international physical activity questionnaire. [14] The subjects were prescribed an exercise program starting with 10 minutes of warm up which included simple stretching exercises followed by range of motion exercises for the low back. These exercises included trunk flexion, extension, lateral bending and rotation exercises. Following this strengthening exercises for the same muscle groups were actively performed by the subjects. The entire exercise session was conducted for the duration of 40 minutes four days in a week for a total of four weeks. A home program was devised for participants that empasized on an active lifestyle including avoidance of prolonged sitting for long hours at a stretch. Postural advice was given to the subjects to avoid unnecessary strain on the muscles while sitting at work settings.

RESULT

The data analysis was done using SPSS software.

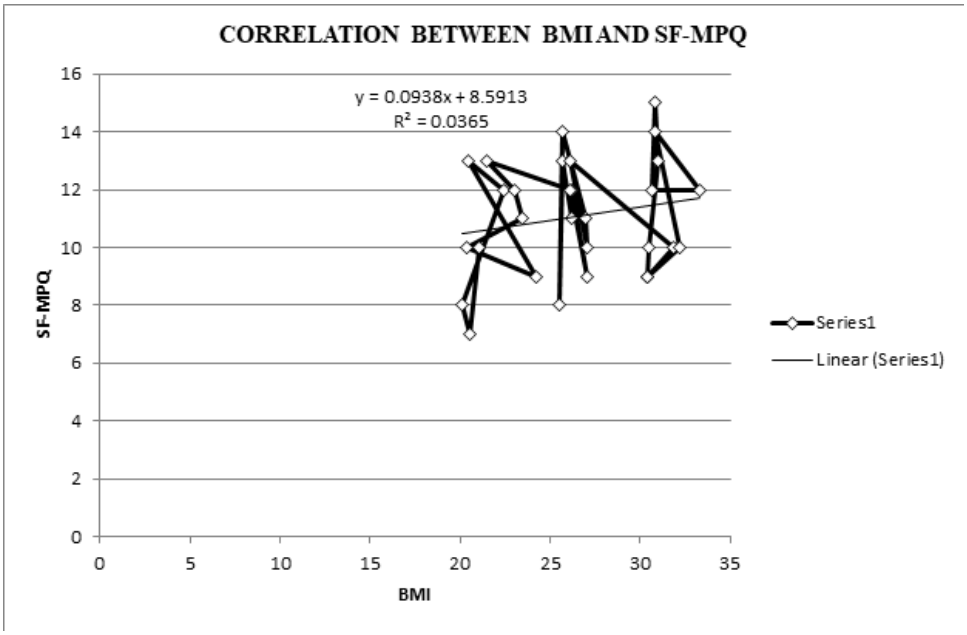

FIGURE 1 : CORRELATION BETWEEN BMI AND SF-MPQ

BMI was in correlation to SF-MPQ scores

Table 1: SF-IPAQ Pre-and post exercise program

	SF-IPAQ PRE (Mean±SD)	SF-IPAQ POST (Mean±SD)	p value
Group 1 N=10	1.7±0.483	2.5±0.516	0.001
Group 2 N=10	1.9±0.567	2.4±0.483	0.104
Group 3 N=10	1.8±0.422	2.2±0.316	0.193

SF-IPAQ score was measured on the first day and after 4 weeks. The paired t test showed significant improvement in Group A and non-significant improvement in Group B and Group C.

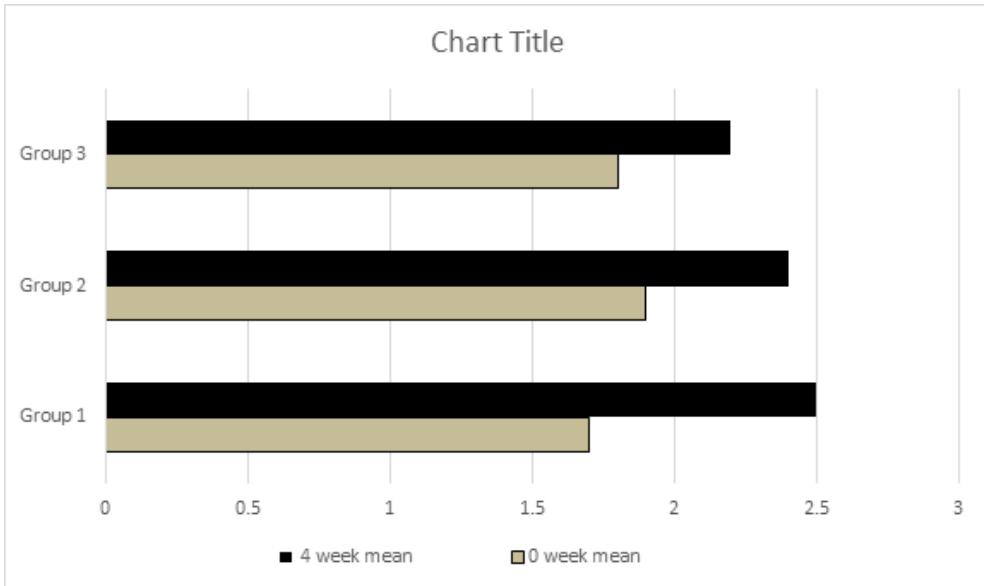

FIGURE 2 : SF-IPAQ SCORE Pre and Post exercise program

DISCUSSION

Overweight and obesity has been called a global epidemic by the World Health Organization.[15] The prevalence of overweight and obesity is especially dramatic in economically developed countries and not only in adults but also in children and adolescents.[16] Being overweight may originate from many different factors ranging from environmental influences on genetic variations.[17] The heritability of predisposition for a high body mass index or body fat content is between 25 and 40%, which suggests that other factors such as environmental factors may also play a critical role.[17] Both the family environment and genetic predisposition influence the development of body fat content and distribution. Other crucial factors include lifestyle factors such as physical activity, nonsmoking, high-quality diet, sedentary activities and normal weight.[18,19]

Obesity is the result of a chronic positive energy balance achieved by consuming more energy than is expended. The primary modifiable variable of the expenditure component is physical activity that is categorized into four domains: occupational, transportation, household, and leisure-time activities. [20] Existing literature presents conflicting findings regarding the association between physical energy expenditure and Body Mass Index .[21] Some studies

conclude that higher BMIs are associated with higher energy expenditure [22] whereas few others report no association between the two. Gender differences appear to contribute further to the controversy .[23]

The present study showed improvement in pain due to musculoskeletal disorders in normal BMI individuals while there was no improvement seen in overweight and obese individuals following physical activity program. High BMI (overweight and weight) was tolerably connected with an expanded pervasiveness of musculoskeletal indications. The outcomes demonstrated noteworthy connection between's physical activity practice, BMI and musculoskeletal pain complaints. This is well in accordance with the existing literaute which shows the relations between overweight or obesity and the pervasiveness of back pain symptoms more grounded for both genders.[24] It is advocated that obesity is a possibly modifiable hazard component for musculoskeletal disorders.

A multidisciplinary treatment approach is required for the management of musculoskeletal disorders prevalent in professionals due to sedentary lifestyle. A combined exercise protocol which include both strengthening and stretching exercises together with resistance training helps to decrease the pain and discomfort of the patient and improve their productivity. The present study emphasizes the role of exercises in decreasing the discomfort and to plan the management of these musculoskeletal system disorders. BMI is a crucial factor well associated with these disorders. It is highly advised for the professionals working for long hours to incorporate active lifestyle to decrease the risk factors leading to faulty postures.

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Conflict of Interest: Nill

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An Empirical Study on Retail Demand for Store Brand Pickles in Tirunelveli, Tamil Nadu

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ABSTRACT

Retail business hasexpanded quickly within a short period in India and has raised critical concerns such as management of service level while meeting consumer needs. That impact the performance of the retailers and their cost-effectiveness. The paper probesthe estimation of demand for a store brand household item, namely Pickle, and demonstrates the benefits of multinomial logistic regression as a useful tool for handling categorical demographic variablesvery frequently used as predictors. Retailers can benefit immensely, by the methodology for other similar products. Moreover, they can enhance space optimization and achieve greaterprofitability per unit retail space and improve customer satisfaction. The research finds that the probability of buying the store brand pickle increases with age of customer and evinces a clear gender bias in the inclination to buy store brand Pickle.

Keywords: *inventory management, assortment planning, multinomial logistic regression, R environment*

INTRODUCTION

Economic policies changes, growth of middle class population, and higher in per capita income hasspurred economic growth in India,leading to prosperi*ty* retail sectoras a resultnow the retail sector represents 10% of India's GDP and a 8% share of employment. Additionally, food inflation is exerting pressure on the retailers to reduceoperating cost to sustainbusiness and profitability. Food price inflation has strained consumer budgets leading them to reduce frequency of visits to the stores and also their purchase volumes. Though it is well known that inflation is due to dynamics of global economic environment, and uncertain rainfall, it has certainly broughtoperations efficiency to retailer's attention.

The competition in the retail in industry in India has been dynamicdue tothe emergence of retail chains and modern retail stores. The critical issues in retailing is the decision about the variety of items a retailer decides to carry for satisfying the consumer. While a wide product assortment meetsevery consumer's needs, it increases inventory. Additionally, it leads to shelf space allocations problems. The problems acquire intensity since retail space is expensive and limited. In view of such constraints, retailers need to use efficient assortment strategies. This means that the retailers would strive to find an optimal mix of products to minimize cost of operations without affecting service levels. This pivots on estimating demand for products. Regression, moving average, and exponential smoothing are frequently used to estimate aggregate demand. At SKU level, logistic regression has been suggested by literature for demand estimation.Logistic regression helps in establishes link between demographics and consumer choice of products. Demographics have been found to be good predictors for retail demand.Demographic variables are categorical in nature and simple regression is not suitable. Logistic regression and multinomial logistic regression are best options. This research uses multinomial logistics regression to determine the probability of purchase as a function of demographic variables age, gender.

Pickles are an integral part of food in Indian households and are traditionally prepared at home using several spices in various combinations leading to different tastes and health benefits. The combination of spices and methodology determines the shelf life of the pickles. It pertinent to point out that homemade pickles do not use preservatives but are prepared in such a manner that they remain good for long durations (2 to 3 years). More over pickles are known to be used

only after a period of maturation, that is generally not less than 6 months. In recent times due to lack of expertise and time families have started to purchase pickles made commercially, which are known to use preservatives and other artificial ingredients. The older generation still believes that pickles made at home are better tasting, hygienic, and good for health as they are devoid of artificial chemicals. While brand owners claim that their products are equivalent to homemade pickles, consumers' trust seems to be latent. Our study does not explicitly dwell into the hygiene aspect of the off the shelf pickles, but it seems that hygiene is an intrinsic part of the consumer choice and purchase intentions. Since we have not explicitly studied the hygienic aspects of the pickle as commercial products, the research does not make any comments on that aspect

Abundant literature on studies on various aspects of supply chain management for FMCG goods including food and grocery items is available. In this study how,inventory can be smartly managed in retail outlets is presented. The retail outlets are the first point contact for consumers and they relay the consumer requirements up the supply chain to the manufacturers. Variables such as floor space, shelf space, display methodology etc. have been identified as the measures that determine selling efficiency.

LITERATURE REVIEW

Retailer's assortment of products is dependent on the target customers, shelf space availability, brand perception, financial strength, and the competitive profile. Even though many retailers claim to offer a one stop shopping experience, providing the whole range of product a random customer would want to buy is next to impossible. Moreover,there is empirical evidencethat on an average customer visit at least three shops before fulfilling all their requirements. The number of consumers served by a retail outlet is so large that satisfying each customer in the target set would be difficult[1] and consumers first-choice preference changes from time to time [2,3]. Consumer preferences are directed by factors such as fulfilment of global and local utility, estimated search cost, and availability of substitutes etc. Such changes can occur due to satiation, need for a change due to changing objectives, social position[4], or to know[5,6] about other items. Such changes lead customers to seek variety. Findings of the above papers means that high levels of heterogeneity in consumer preferences are ubiquitous and a retailer may have to stock an extensive variety of products and SKUs. Stocking of inventory is limited by availability of resources. In addition, studies have evinced that offering too many choices negatively affects consumer perception about the store[7,8] because consumers are beset with the amount of choice and find it difficult arrive at a purchasing decision and the customers may not come back to the store[9]. Moreover, apparent variety has an influence on consumers' buying decision and a mismatch between actual variety and perceived variety can potentially negatively impact buying experience and may lead to lost sales or the consumer [10,11,12]. Perceived variety is dependent on method of display and the symmetry of the assortment [13]. Further retailers may lose sales (lost sales to extent of 4% occurs due to OOS[14] due to out of stock situations in which the consumer can either buy a substitute or buy the preferred product from a competing store. The following table shows reactions to stock out situations:

Multinomial Logit model (MNL)

Theory of utility is the basis for the MNL model. Each customer relates a utility for the purchase or no-purchase of a particular category/SKU. The no-purchase decision is coded in the model as product 0, i.e.when a customer chooses product 0 it is considered a no purchase decision. The consumer's utility related to choose of a product j from S U {0} the Union of set of products carried by the retailer and product 0 is represented as U_j. The utility U_j is considered to be sum of a deterministic part and a random part

$$U_j = u_j + \varepsilon_j$$

The random portion is modeled as a double exponential random variable with the following distribution:

$$\Pr \{X < \varepsilon\} = \text{Exp} (-\text{Exp} - (\varepsilon/\mu + \gamma))$$

Where γ is Euler's constant (0.57722). Its mean is zero, and variance is $\mu^2\pi^2/6$. As the degree of heterogeneity among the customers increases μ also increases. The ε_j are independent across consumers. Hence the product wise general utility for each consumer is same; the actual realized utility may be different based on the level of heterogeneity of the customer population. Additionally, unobservable factors determining the utility of the product to the individual may also be a cause. An individual maximizes utility when choosing

a product from the available set. Hence, the probability that an individual chooses product j from S U {0} can be represented as

The double exponential distribution being closed under maximization we can write the probability that a random customer chooses product j from S U {0} as (For proof refer Anderson et al (1992)19.

Guadagni and Little (1983)[15], show how MNL model can be used for estimating demand for a group of products.

The major criticism for the MNL model is due to Independence of Irrelevant Alternatives (IIA) property. This property is true when ratio of choice probabilities for any two alternatives is independent of ratios for other such alternatives. When we compare two brands within a category, choices within one brand will only lead to cannibalization under high brand loyalty and this property would not be true. Such situations are not rare. One way of overcoming this is to use a Nested Logit Model that is the customer first makes a choice of the brand and follows it up with choosing the SKU. Probability of choosing within a brand follows an exponential distribution and hence the choice probability between two brands also follows an exponential distribution and we can write the total probability as

In which the first term on the right hand side refers to the choice between brands and the second term refers to the choice within a brand. One difficulty in using this nested logit model is that we need know the product attributes the customer uses in the choice process and how the customer prioritizes them. The MNL is also deficient in capturing intricate issues with substitution behavior. The model cannot differentiate between products that have same penetration rate but different substitution rates.

METHODOLOGY

A retail store frequented many consumers located in a residential area was chosen for the study. The name of store and Picklebrand is being kept confidential for commercial reason at the request of the store owner. Mall encounter method of sampling was used to find out purchase intention of store the brand pickle.Ashort demographic profile consisting only of gender and age was also collected as only these two demographic variables are used in this analysis. In total details from 133 customers was collected and analyzed. The analysis was carried out using "nnet" package in the R environment. Chi square test function available in the generic R environment was used to perform chi square test prior to performing the multinomial regression.

RESULTS AND DISCUSSION

The sample profileis as in table 1

Table 1: Sample Profile

Total number of respondents	**133**
Gender ratio	62% male and 38 % female
Age group Group I 20-25 years Group II 26 -30 years Group III 31 -35 years	 39% 30% 31%

As a firststep the data was put through a chi square test to see if there are significant differences between the groups based on gender, age and education. The Routput for chi square test is given in table 2:

Table 2: Pearson's Chi-squared test with Yates' continuity correction for gender Vs purchase intention

data: product purchase		
Chi Square	**Df**	**P – Value**
12.032	1	0.005228

The null hypothesis that there is no gender-based difference in purchase intentions is rejected at alpha of 5%. Which indicates that there is significant difference men and women about choice of Pickel brands.A similar chi square test on age and purchase preference yielded the following results:

Table 3: Pearson's Chi-squared test for Age group vS Purchase intension

data: purchase of product		
Chi Square	**Df**	**P – Value**
10.036	2	0.006619

Which clearly shows that the purchase preference of different age groups is different and highly significant at an alpha of 5%.

The output of the multinomial logistic regression using "multinom" function in nnet package is given below in table 4

Table 4: Multinomial Regression: logit z associated with purchase intention and independent variables Age and Gender

Coefficients:	Values	Std. Err.	P values
Intercept	3.50769445	1.225891	0.0042185035
Age	-0.09448192	0.041458	0.0226683025
Gender	-1.46494357	0.397377	0.0002273296

Residual Deviance: 165.2999

AIC: 171.2999

From the table it is clear that all the coefficients are significant at an $\alpha = 0.05$. The following regression equation (* is used as multiplication sign) can be constructed from the above

(logit) Z = 3.5077 – 0.0945*Age – 1.465*Gender (1)

The probabilities can be calculated using equation 2

$$P = e^{\wedge Z}/(1+e^{\wedge Z}) \qquad (2)$$

From the regression equation it can be inferred that the variables age and gender have negative effect on the probability of purchase, i.e. as we move from group I to Group II in the age category the probability of purchase diminishes by a factor of 0.0945 and between men and women the change in probability is to the extent of 1.46. This is clear from the predicted probabilities for the sample.

The predicted probabilities are given in table 5

Table 5: Predicted probabilities

Age	Gender	Logit(Z)	Exp(Z)	Predicted probabilities
34	1	-1.1696	0.31	0.24
30	1	-0.7917	0.453	0.31
33	1	-1.0752	0.341	0.25
31	0	0.57875	1.784	0.64
28	1	-0.6027	0.547	0.35
30	0	0.67324	1.961	0.66
30	1	-0.7917	0.453	0.31
22	0	1.42909	4.175	0.81
24	1	-0.2248	0.799	0.44
29	1	-0.6972	0.498	0.33
20	1	0.15311	1.165	0.54
30	0	0.67324	1.961	0.66
31	1	-0.8862	0.412	0.29
21	1	0.05863	1.06	0.51
30	1	-0.7917	0.453	0.31
32	0	0.48427	1.623	0.62
31	1	-0.8862	0.412	0.29
27	1	-0.5083	0.602	0.38
27	1	-0.5083	0.602	0.38
20	0	1.61806	5.043	0.83
22	1	-0.0359	0.965	0.49
20	0	1.61806	5.043	0.83
25	1	-0.3193	0.727	0.42
23	1	-0.1303	0.878	0.47
31	0	0.57875	1.784	0.64
24	1	-0.2248	0.799	0.44
33	1	-1.0752	0.341	0.25

Gender is coded as Male = 1 and Female = 0

Summary analysis of the predicted probabilities based on gender and age group is presented in table 6. From the table it can inferred that women of all age groups have greater preference for the store brand Pickle whereas younger men prefer the store brand Pickle than older men.

Table 6: Average Predicted Probabilities

Age group 20 - 25	
W	M
0.79	0.48
Age group 25-30	
W	M
0.68	0.35
Age group 31-35	
W	M
0.61	0.25

CONCLUSION

It has been established, how demographic data can be used to estimate demand for packaged food item such as Pickle. Additional demographic details could be used to get further clarity about the purchase intent of customers but the investigation becomes tedious and statistical significance may not be realized, thereby making the results not useful for realistic demand estimation. Additionally, the study provides direction for future research with more detailed demographic profile of customers to enable the retailers to manage their inventory and shelf space well and reduce cost of operations. Further simulation can be used to produce greater clarity into the buying behavior of consumer. Moreover, the analysis presented here can also be used by manufacturers to develop marketing plans for their merchandises. The preference for the store brand is gender as well as age dependent. Older age customers have greater preference for the store brand pickle when compared to younger customers. Women have greater preference for the store brand pickle across all age groups but men of younger age have greater preference for the store brand pickle than older age men.

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Conflict of Interest: Nil

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Knowledge of Disease Management among Maintenance Hemodialysis Patients in Coastal Karnataka – A Cross Sectional Pilot Study

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ABSTRACT

Patients' understanding and knowledge of the disease condition and its management are crucial factors in achieving treatment goals and in empowering patients for self-care management.It is therefore necessary to assess knowledge levels and knowledge needs among dialysis patients and to educate them sufficiently on disease management and therapeutic regimens.Methodology: Cross sectional pilot study among 31 maintenance hemodialysis(HD) patients.Strata of three groups was developed:Patients on HD since <15days,15 days to 4 months,4 months and above.A validated questionnaire covering five domains:disease knowledge,infection,dialysis treatment,fistula care and nutrition was administered to patients from the 3 strata.Results:16.1% had poor knowledge,23% had moderate knowledge and 3% had good knowledge regarding their disease condition.9.7% had moderate knowledge and 80.6% had poor knowledge on infection prevention measures.77.4% had moderate knowledge and 12.9% had poor knowledge on dialysis treatment and safety.49.6% had moderate knowledge and 80.6% had poor knowledge on nutrition management for their disease condition.80.6% had moderate knowledge and 9.7% had poor knowledge on fistula care. Conclusion: There is a need for a sustainable model of multidisciplinary educational intervention to educate patients on dialysis,since the cost of a multidisciplinary approach is a challenge in a limited resource setting as well as an additional financial burden for patients.

Keywords: *Chronic Kidney Disease, CKD, Maintenance hemodialysis, Kidney failure*

INTRODUCTION

Chronic kidney disease (CKD) is a chronic condition and a leading global health problem. CKD is characterized by gradual loss of kidney function. Diabetes and hypertension today account for 40–60% of cases of CKD in India.[1] The Indian council of medical research reports the prevalence of diabetes in the Indian population to be 7.1%,and amongst the urban population above the age of 40 years to be 28%.[2,3] Given India's population of more than 1.3 billion people,the rising rate of CKD is very likely to pose serious questions to health services and the economy in the future. The age-adjusted incidence rate of ESRD in India is estimated to be 229 per million population.While more than 200,000 new patients every year need renal replacement in India,only 10 percent of them actually receive some form of renal replacement[4] The estimated global prevalence of CKD is between 11 to 13%, with the majority being in stage 5.[5] Millions die every year because of a lack of access to treatment and/or a lack of capacity to pay for the treatment.[6]Globally,nearly 1.9 million patients

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go through renal replacement therapy every year,with continued use by 316 per million population and annual initiation by 73 per million population(31.6 per 100,000 and 7.3 per 100,000).[7]A review of 29 published dietary intake studies on maintenance dialysis patients reported that the majority of patients were unable to meet the recommended daily dietary protein/energy intake and that there was a wide variation in the intake. Evidence of muscle wasting is seen in 18 to 75% of patients with CKD undergoing maintenance dialysis therapy.[8,9] Patients' knowledge regarding care of kidney disease and hemodialysis care will help them to be better informed about the disease,and is an important factor in improving adherence to treatment.Accurate and permanent education on diet,complications of hemodialysis and prevention and care of comorbidities can increase the self-care ability,health literacy and adherence of patients.[10]

A quasi-experimental study in the United states which studied the effect of education on diet and patient knowledge among hemodialysis patients with sessions of 20 to 30 minutes, reported improved phosphorous levels and knowledge which further improved in the next six months, and no difference in serum calcium and serum PTH levels.[11]Finkelstein et al report 35% of pre-ESRD patients being unaware of any treatment modality for ESRD.Forty-three percent were unaware of hemodialysis,56% were unaware of transplantation,57% were unaware of continuous ambulatory peritoneal dialysis and 66% were unaware of automated peritoneal dialysis.Patients' understanding of kidney diseases would improve with the worsening of their condition:the reason being the increased contact with the nephrologist.[12]

A significant variation exists in the capacities of patients on hemodialysis in obtaining their recommended nutrient requirements.The majority of hemodialysis patients are unable to meet their recommended daily protein and/or energy intake.Evidence of wasting was observed in between 18 and 75 percent of hemodialysis patients.[13,14]To improve the success of hemodialysis and improve outcomes in patients undergoing hemodialysis,it is important to increase patients' nutritional education in line with the 2006 clinical practice guidelines and recommendations.[15]

RESULTS

As seen in table 1,16.1% had poor knowledge,23 % had moderate knowledge and 3 % had good knowledge of their disease condition.9.7% had moderate knowledge and 80.6% had poor knowledge of infection prevention measures.77.4% had moderate knowledge and 12.9% had poor knowledge of dialysis treatment and safety.49.6% had moderate knowledge and 80.6% had poor knowledge of nutrition management for their disease condition.80.6% had moderate knowledge and 9.7% had poor knowledge of fistula care.

Table 1: Levels of knowledge across various knowledge domains among hemodialysis patients.

Knowledge domains	Good N(%)	Moderate N(%)	Poor N (%)
Kidney disease	(3)9.6	(23.0)74.1	**(5)16.1**
Infection	**(3)9.7**	**(3)9.6**	**(25)80.6**
Dialysis treatment	**(3)9.7**	**(24)77.4**	**(4)12.9**
Fistula care	**(3) 9.7**	(25)80.6	**(3) 9.7**
Nutrition	**(3)9.7**	**(3)9.6**	**(25)80.6**

Table 2: Mean and standard deviation

Knowledge domain	Mean	Std. Deviation
Infection	10.2581	7.79730
Dialysis treatment	7.6129	4.22435
Fistula Care	5.2581	3.48298
Nutrition	15.2903	11.96437
Kidney disease	16.6333	9.18200

Association of knowledge domains and sociodemographic factors

A significant association was seen among the following domains and socio demographic factors:

Knowledge of kidney disease and age (table 03),

Knowledge of dialysis treatment and type of vascular access

Knowledge of nutrition and type of vascular access

Knowledge of dialysis treatment and dialysis days

Table 3: Association of knowledge domains and sociodemographic factors

Socio demographic	Knowledge of kidney disease (n=31)			p-value
	Good	Moderate	Poor	
Age (years) <30 31-40 41-50 50 and above	0 1 (12.5%) 1 (20%) 1 (6.25%)	2 (100%) 5 (62.5%) 4 (80%) 13 (81.25%)	0 2 (25%) 0 2(12.5%)	0.026*
Vascular access	Knowledge of dialysis treatment (n=30)			
Fistula IJV femoral	3(13.6 %) 0 0	19(86.4%) 3(50 %) 2(66.7%)	0 3(50 %) 1(33.3%)	.036*
Knowledge of nutrition (n=31)				
Fistula IJV Femoral	3(13.5%) 0 0	18(82 %) 6(100 %) 1(33.3 %)	1(4.5%) 0 2(66.7 %)	0.009*
Dialysis days	Knowledge of dialysis treatment(n=31)			
>15 days 16 to 120 days 120 days and above	0 0 4(30.8%)	6(75 %) 8(80%) 9 (69.2%)	2(25%) 2(20%) 0	.036*

DISCUSSION

The results have shown that there is a need to improve patient knowledge and awareness levels of infection prevention and nutrition. ie 80.6 % had poor level of knowledge.16.1% had poor knowledge of kidney disease.12.9 % had poor knowledge of dialysis treatment.9.7% had poor knowledge of fistula care. David et al reported HCV seroprevalences ranging between 0.7% and 18.1% across different countries in the Asia pacific region.The seroprevalances were generally higher in HD as compared to Peritoneal Dialysis(PD) populations. No associations were found with respect to HBV.[13] Standard guidelines,regular interviews and updates of policy have been used to ensure high levels of compliance and knowledge regarding vascular access infection control among nurses.[15] Standard guidelines and regular reviews and updates of policies.

Systems should also be developed to ensure a high level of compliance standard guidelines and regular reviews and updates of policies.

Systems should also be developed to ensure a high level of compliance

Patients with improved knowledge showed better adherence to treatment and a lower infection rate.This was achieved through ongoing evaluation,training and home visits.[16] Assessment of nurses' and patients' knowledge regarding modes of transmission has been determined to be an important factor.A study conducted in Saudi Arabia in a setting with different infection prevalence rates in dialysis units explored the knowledge of nurses regarding the modes of transmission for HCV on a 10 point scale.In the high prevalence unit,nurses ranked blood transfusion at 9 and contaminated HD machines at 7.Nurses in the low prevalence unit ranked dialysis in other centers at 7.8,nurse transmitting the virus from patient to patient at 6.6,blood transfusion at 6 and contaminated HD machines at 6.[17]

Malnutrition can contribute to mortality among dialysis patients.The major causes of malnutrition are metabolic acidosis,restricted diet,loss of appetite as a side effect of the drugs,uremia leading to anorexia,chronic volume overload,dialysis and the presence of acute and chronic systemic disease causing an inflammatory response.[14]The present study found patient knowledge levels of nutrition management to be very poor(80.6% of patients had poor knowledge levels).This clearly indicates that patients require intensive nutritional counselling,diet recalls and diet plans to improve their knowledge and practice.Adequate nutrition is very important for dialysis patients for a better overall outcome. Protein energy malnutrition is highly prevalent(25-50%) among dialysis patients and is associated with increased morbidity and mortality.Adequate and safe intake of protein,calories,sodium,potassium, phosphorous and fluid are important for the wellbeing of dialysis patients.Nutritional intervention that is tailored specifically considering barriers can result in improved albumin levels even among patients with high levels of C reactive proteins.These barriers could be a lack of knowledge,poor appetite,inadequate dialysis or support to cook.[18] A nurse led intervention educating patients on CKD, hyperphosphatemia,signs and symptoms,treatment,phosphate binder use,dietary care,benefits,risks and options for improving health-related quality of life ineffectively reduced hypophosphatemia and improved albumin levels.[19]

Teaching and weekly reinforcement about diet,fluids and control of weight gain reduced interdialytic weight gain and improved adherence.However it did not improve mean blood pressure[20].Since nephrology nurses have a long term relationship with patients,educating patients through them would be ideal.[20]A nurse working on a protocol and administering patient education on disease management brought about improved hemoglobin and albumin levels of patients.[21]A unique study focussing on public health dimensions and perspectives to improve hyperphosphatemia concluded that vigorous public marketing campaigns to promote fruits and vegetables may alter food preferences.Availability of junk food high in phosphorous,proximity to stores and vending machines influence dietary intake among patients. Phosphorus content being listed on food labels enables dialysis patients to monitor their intake.[22]

An educational intervention is as effective as oral supplementation to prevent malnutrition and treatment of malnutrition.Improved creatinine and protein serum values,and other biochemical parameters were the markers of effectiveness.[23]A nurse administered protocol,training received through theoretical input,case training and review and guided readings on related content resulted in both the study and the control groups improving over time,with significant intragroup improvements and no intergroup differences.[24]

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Study on Global Public Health Threats due to Emerging or Re-Emerging Infectious Diseases and the Strategies to Reduce Threats

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ABSTRACT

The occurrence of emerging and re-emerging infectious diseases in humans has increased in the recent past and imposing a serious public health threat globally. Despite remarkable advances in medical science and treatment during 20th century, infectious diseases remain the leading cause of death worldwide. Over 30 new infectious agents have been detected worldwide in the last 20 years and 60 per cent of these are of zoonotic origin. Recent world events, such as the 2014 Ebola epidemic, have brought public attention to challenges imposed by emerging and re-emerging infectious diseases. Evolution of pathogenic infectious agents with genetic change, antimicrobial resistance, insecticide resistance, human demographic and behavioral change, human susceptibility to infections, poverty and social inequality, climate and changing ecosystem, urbanization and deforestation, increase international travel and trade, deterioration in public health surveillance and breakdown of public health measures are the main contributing factors of emerging and re-emerging infections. Coordinated, well-prepared and well-equipped health systems; partnerships among clinicians, microbiologists and epidemiologists; improved methods for detection & epidemiological surveillance & laboratory capabilities and services; screening on international travels and trades; effective preventive & therapeutic technologies; strengthened response capacity; political commitment & adequate resources to address underlying socio-economic factors and international collaboration & communication are utmost important for managing emerging and re-emerging diseases worldwide

Keywords*: Ebola epidemic, Emerging and re-emerging infectious diseases, Public health threats, Zoonotic diseases.*

INTRODUCTION

Over the last two centuries, science has made huge progress in the fight against infectious diseases. But the biggest battles may still be to come. With tens of thousands of peopletaking planes every day, contagious illnesses have unprecedented opportunities to spreadfarther and faster. Antibiotics that once cured diseases like tuberculosis now do not alwayshave an effect. Old enemies like polio refuse to go away. Others like smallpox threaten adevastating comeback if released. Since the 1970's new diseases have been identified atthe unprecedented rate of one or more per year, and scientists are warning of a possibleworldwide epidemic involving a killer virus that they believe does not even exist yet[1]. Global public health security is defined as the activities required to prevent and respond to threats that endanger the collective health of people across different regions and nations. Lack of global public health security may also have consequences in terms of economic or political stability, trade, tourism, access to goods and services and demographic stability. Global public health security covers a wide range of complex and daunting issues, including health consequences of human

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behavior, climate change and weather-related events, infectious diseases, natural catastrophes and man-made disasters[2]. There is strong evidence to suggest that this income inequality or disparity between the different socioeconomic classes is associated with worse health outcomes. The high burden of disease, disability and death can only be addressed through an effective public health system. However, the growth of public health has been very slow due to low public expenditure on health, very few public health institutes and inadequate national standards for public health education[3].

MATERIALS & METHOD

This study aimed to give an overview on global public health threats due to emerging or re-emerging infectious diseases and the strategies to reduce threats. This study reviewed and analyzed various publications and reports pertinent to emerging infectious diseases burden and its global impact. The incidence of emerging infectious diseases in humans has increased within the recent past or threatens to increase in the near future. In the recent past, world has seen outbreaks of various organisms of emerging and re-emerging diseases in various parts of the world and most of these are of zoonotic origin. Prevention and control of emerging infectious diseases will increasingly require the application of sophisticated epidemiologic and molecular biologic technologies, changes in human behaviour, a national policy on early detection of and rapid response to emerging infections and a plan of action.

FINDINGS

Pandemic Risk

Among policymakers who worry about it at all, optimists think a severe pandemic is a once-in-a-century event. But before the onset of the 2014 Ebola epidemic, most people, including policymakers, seldom thought about pandemics (worldwide epidemics)—which explains why the risk of contagion is undermanaged and the Ebola crisis is here at all. Ebola is still largely confined to three small West African countries, where the human, social, and economic damage is already high. If the crisis is not contained, damaging health and economic impacts would bereplicated in other developing countries and even on a globalscale in the case of a pandemic.Contagionsurprises and then worsens because the authoritiesand the public are unaware of the risk and implicationsof exponential spread. Even without a global spread, disease outbreaks can be very costly. They occur with unnervingfrequency. Recent years saw Severe Acute Respiratory Syndrome (SARS) and H5N1 and H7N9 avian flu—and now we face the Ebola crisis. With current policies, one of these, or another pathogen, will cause a pandemic[4].

Emerging Infectious Diseases:

These include new, previously undefined diseases as well as old diseases with new features. These new features may include the introduction of a disease to a new location or a new population (*e.g.* it may present in youth where previously it was only seen in the elderly); new clinical features, including resistance to available treatments; or a rapid increase in the incidence and spread of the disease. Emergence may also be due to a new recognition of an infectious agent in the population or the realization that an established condition has an infectious origin. Over 30 new infectious agents have been detected worldwide in the last three decades; 60 per cent of these are of zoonotic origin, and more than two-thirds of these have originated in the wildlife. Epidemics or pandemics caused by these emerging and re-emerging infections often take a heavy toll of life and by rapidly spreading across borders are responsible for much concern and panic. Besides health, emerging infections also present a grave economic, developmental and security challenge [5].

Re-emerging infectious disease

Infectious agents that have been known for some time, had fallen to such low levels that they were no longer considered public health problems & are now showing upward trends in incidence or prevalence worldwide or have appeared in areas where they were not previously found. Reappearance of a disease which was once endemic but had since been eradicated or controlled, would classify it as a re-emerging infectious disease.

Factors Contributing to Emergence:

Evolution of pathogenic infectious agents (microbial adaptation & change), Mutations, Development of resistance to drugs, Resistance of vectors to pesticides, Antimicrobial Drug Resistance are the main agents. Human demographic change (inhabiting new areas) leading to increase contact with animals and natural environment, human behavior (sexual, drug use by

sharing needles), human susceptibility to infection (Immunosuppression) due to stress and lifestyle changes, nutritional changes, more use of pesticides, poverty & social inequality, wars, civil unrest, agricultural practices such as pig or poultry farming, breakdown of public health measure, globalization of travel and trade etc. contribute to emergence.

Emerging Infections in the World

1973 Rotavirus	Enteritis/Diarrhea	1990 Guanarito virus	VHF
1976 Cryptosporidium	Enteritis/Diarrhea	1991 Encephalitozoon	Disseminated dz
1977 Ebola virus	VHF	1992 Vibrio cholerae O139	Cholera
1977 Legionella	Legionnaire's dz	1992 Bartonellahenselae	Cat scratch dz
1977 Hantaan virus	VHF w/ renal Failure	1993 Sin Nombre virus	Hanta Pulm. Synd.
1977 Campylobacter	Enteritis/Diarrhea	1994 Sabia virus	VHF
1980 HTLV-1	Lymphoma	1994 Hendra virus	Respiratory dz
1981 Toxin prod. S.aureus	Toxic Shock Synd.	1995 Hepatitis G	Hepatitis
1982 E.coli 0157:H7	HUS	1995 H Herpesvirus-8	Kaposi sarcoma
1982 HTLV-II	Leukemia	1996 vCJD prion Variant	CJD
1982 Borreliaburgdorferi	Lyme disease	1997 Avian influenza (H5N1)	Influenza
1983 HIV	AIDS	1999 Nipah virus	Encephalitis
1983 Helicobacter pylori	Peptic ulcer dz	1999 West Nile virus	Encephalitis
1988 Hepatitis E	Hepatitis	2001 BT Bacillus anthracis	Anthrax
1989 Hepatitis C	Hepatitis	2003 Monkeypox	Pox
		2003 SARS-CoV	SARS

Emerging Virus	**Re-emerging Virus**
2001 - Nipah Virus(Bangladesh, India)	• Ebola
2003 - SARS Coronavirus	• Marburg
2004 - Avian Influenza(H5N1), Thailand,Vietnam	• Dengue
2006 - Influenza H5N1(Egypt, Iraq)- New Human Rhinovirus(USA)	• Yellow fever
2007 - Nipah Virus(Bangladesh)- LCM like Virus(Australia)- Polyoma like virus(Australia)	• Chikungunya
2009 - Influenza H1N1	• Chandipura
2011 - Crimean Congo HemorrhagicFever (India)	• West Nile Virus
	• Rift Valley Fever
	• Human Monkey Pox

Emerging Bacteria	**Re-emerging Bacteria**
• Drug resistant MTB- BothMDR and XDR	• Cholera, H. pylori,
• MRSA	• Neonatal tetanus
• VRE	• Yersinia pestis
• CR – GNB esp. Klebsiella	• Rickettsia
• E. coli O104: H4	• Cl. Difficile
• *Stenotrophomonas*spp.	• Cl. Botulinum
• Extended spectrum betalactamaseproducingpathogens	• Bacillus anthracis (due to bioterrorism)
	• Fransciella

Global trends and burden of Emerging Infectious Diseases

Emerging infectious diseases (EIDs) are a significant burden on global economies and public health. Their emergence is thought to be driven largely by socio-economic, environmental and ecological factors, but no comparative study has explicitly analysed these linkages to understand global temporal and spatial patterns of EIDs. EID events are dominated by zoonoses (60.3% of EIDs): the majority of these (71.8%) originate in wildlife (for example, severe acute respiratory virus, Ebola virus), and are increasing significantly over time. It was found that 54.3% of EID events are caused by bacteria or rickettsia, reflecting a large number of drug-resistant microbes in our database. The emerging infectious diseases account for 26 per cent of annual deaths worldwide. Nearly 30 per cent of 1.49 billion disability-adjusted life years (DALYs) are lost every year to diseases of infectious origin. The burden of morbidity and mortality associated with infectious diseases falls most heavily on people in developing countries, and particularly on infants and children [5]

SARS: Severe acute respiratory syndrome (SARS) is a viral respiratory illness caused by a coronavirus, called SARS-associated coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003. Over the next few months, the illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the SARS global outbreak of 2003 was contained. According to the World Health Organization (WHO), a total of 8439 people worldwide became sick with SARS during the 2003 outbreak. Of these, 812 died[6]. It caused tremendous negative economic impact on trade, travel and tourism, estimated loss of $ 30 to $150 billion. High level commitment is crucial for rapid containment . Global partnerships & rapid sharing of data/information is utmost important to enhance preparedness and response.

Highly Pathogenic Avian Influenza (H5N1): Since Nov 2003, avian influenza H5N1 in birds affected 60 countries across Asia, Europe, Middle-East & Africa. More than 220 million birds killed by AI virus or culled to prevent further spread. Majority of human H5N1 infection due to direct contact with birds infected with virus. Total 860 cases and 454 deaths among human reported in 16 countries, mostly in Egypt, Indonesia, Vietnam, Cambodia, China & Thailand.

Novel Swine origin Influenza A (H1N1): After early outbreaks in North America in April 2009 the new influenza virus spread rapidly around the world. By the time WHO declared a pandemic in June 2009, a total of 74 countries and territories had reported laboratory confirmed infections. To date, most countries in the world have confirmed infections from the new virus. The global impact of the current pandemic has not yet been estimated. Typically, the numbers of deaths from seasonal influenza or past pandemics are estimated using statistical models. By contrast, the currently reported counts of over 16,000 deaths from pandemic H1N1 represent individually tested and confirmed deaths, primarily reported from countries with adequate resources for widespread laboratory testing[7]

Ebola Virus Disease (EVD)

Ebola virus disease (EVD), formerly known as Ebola haemorrhagic fever, is a severe, often fatal illness in humans. The virus is transmitted to people from wild animals and spreads in the human population through human-to-human transmission. The average EVD case fatality rate is around 50%. Case fatality rates have varied from 25% to 90% in past outbreaks. The first EVD outbreaks occurred in remote villages in Central Africa, near tropical rainforests. The 2014–2016 Ebola outbreaks in West Africa Ebola was the largest in history, affecting multiple countries in, and beyond, West Africa which involved major urban areas as well as rural ones. A total of 28 616 confirmed, probable and suspected cases have been reported in Guinea, Liberia and Sierra Leone, with 11 310 deaths. Good outbreak control relies on applying a package of interventions, namely case management, infection prevention and control practices, surveillance and contact tracing, a good laboratory service, safe burials and social mobilization [8].

Zika Virus Disease: It is a mosquito-borne flavivirus that was first identified in Uganda in 1947 in monkeys through a network that monitored yellow fever. It was later identified in humans in 1952 in Uganda and the United Republic of Tanzania. Outbreaks of Zika virus disease have been recorded in Africa, the Americas, Asia and the Pacific. From the 1960s to 1980s, human infections were found across Africa and Asia, typically accompanied by mild illness. The first large outbreak of disease caused by Zika infection was reported from the Island of Yap (Federated States of Micronesia) in 2007. In July 2015 Brazil reported an association between Zika

virus infection and Guillain-Barré syndrome. In October 2015 Brazil reported an association between Zika virus infection and microcephaly. From 2007 to 5 February 2016, Zika viral transmission has been documented in a total of 44 countries and territories[9].

International Health Regulations to combat the international spread of diseases

In order to contain diseases through control measures at international borders, the International Health Regulations (IHR) were adopted in 1969. In the globalized world of the 21st century, borders alone cannot stop the international spread of diseases. With increased air-travel and trade, an outbreak or epidemic in anypart of the world is only a few hours away from becoming a threat somewhere else. Responding to these new global challenges, Member States of the United Nations (UN) agreed on a new set of regulations, which came into force in June 2007. The focus of the 2005 International Health Regulations is not to control diseases at borders but to quickly tackle any outbreak at its source. The 2005 International Health Regulations address public health threats such as infectious diseases, as well as the accidental or intentional release of chemicals, radioactive materials and of any microorganism that may cause health effects and sickness. The WHO responds to incidents reported by official sources or which are detected by its own networks. International measures to prevent the spread of infectious diseases are still essential in the 21st century. WHO coordinates international outbreak response using resources from Global Outbreak Alert and Response Network (GOARN) [10].

Recommended strategies to reduce threats

• Improve Global Response Capacity: WHO and National Disease Control Units can play important role

• Improve Global Surveillance: By improving diagnostic capacity (training, regulations), communication systems (web, e-mail etc.), rapid data analysis, developing innovative surveillance and analysis strategies, utilizing geographical information systems, global positioning systems and the Global Atlas of Infectious Diseases (WHO)

• Use of Vaccines: Increase coverage andacceptability (e.g., oral), new strategies for delivery, develop new vaccines, decrease cost, decrease dependency on "cold chain".

• New Drug Development: Decrease In appropriate drug Use, improve education of clinicians and public, decrease antimicrobial use in agriculture and food production

• Improve vector and zoonotic control: Develop new safe insecticides and develop more non-chemical strategies e.g. organic strategies

• Better and more wide spread health education

CONCLUSION AND THE WAY FORWARD

There is an urgent need for global help to Developing countries Commitment to technology transfer and global collaboration is essential if we are to have the agility required to keep pace with emerging infectious diseases. Pathogen surveillance and discovery can promote global interaction via collaborations on matters that know no national or political boundaries but simply reflect our common goals. Humans, domestic animals and wildlife are inextricably linked by epidemiology of Emerging infectiousdiseases (EIDs). It will continue to emerge, re-emerge and spread. Human-induced environmental changes, interspecies contacts, altered social conditions,demography and medical technology affect microbes' opportunities. Prevention and control of emerging infectious diseases will increasingly require the application of sophisticated epidemiologic and molecular biologic technologies, changes in human behaviour, a national policy on early detection of and rapid response to emerging infections and a plan of action. WHO has made several recommendations for national response mechanisms. A meaningful response must approach the problem at the systems level. A comprehensive global strategy on infectious diseases cutting across all relevant sectors with emphasis on strengthened surveillance, rapid response, partnership building and research to guide public policy is needed.

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A Study to Compare the Efficacy of Dynamic Soft Tissuse Mobilization Vs Self Myofascial Release Techniques for Hamstring Tightness in Healthy Male

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ABSTRACT

Background: Hamstring tightness is one of the most common sports- related injury, Hamstring tightness is the asymptomatic problem and it predisposes to the heel pain, knee pain and low back pain due to compensatory mechanism for the controlling excess lumbar lordosis, Though it is asymptomatic, should be prevented to avoid further risk of problem, According to this, the study was designed to improve the flexibility of hamstring muscles.

Objective: To find the efficacy of dynamic soft tissue mobilization in increase hamstring flexibility,To find the efficacy of self myofascial release technique in increase hamstring flexibility,To compare the efficacy of dynamic soft tissue mobilization and self myofascial release technique in hamstring flexibility.

Results: On comparing both dynamic soft tissue mobilization (DSTM) and self myofascial release technique (SMRT) there is no significant difference in AKET scores on both right and left side . But both are equally significant in improving the hamstrings flexibility as individual techniques .By the comparing the AKET right side ($t(28df)=1.03$, $p=0.3098>0.005$) the mean difference in AKET right between before and after treatment for group A is 18.73 and that group B is 17.53. By the AKET left side ($t(28df)=1.05$, $p=0.3041>0.005$)the mean difference in AKET left between before and after treatment for group A is 16.27 and that group B is 15.07.

Conclusion: On the basis of analysis, both dynamic soft tissues mobilization and self myofascial release technique are individually effective on hamstring tightness subjects in terms of active knee deficit or extension lag through AKET scores.

Keywords: *active knee extension testing, self myofascial release technique, dynamic soft tissue mobilization.*

INTRODUCTION

The hamstring is the posterior compartment of thigh muscle. Muscle tightness is due to a reduction in the ability of the muscle to deform. The term has also been used to denote a slight to moderate decrease in muscle length; Muscle tightness usually results from inadequate or improper rehabilitation following sustained muscle injury or low levels of physical activity in individuals[2]. The hamstrings play a crucial role in daily activity such as walking, running, jumping and controlling some movement of the trunk. The complete range of knee flexion rarely occurs in activity of daily living therefore the complete contraction and stretching of this muscles group is rare[3]

Hamstring tightness may be measured using the active unilateral SLR test, passive unilateral SLR test, sit and reach test and the active knee extension test. The AKET measures hamstring tightness by the angle subtended by knee flexion after a maximum active knee extension, with the hip stabilized at 90 degrees. The test-retest reliability coefficient for the AKET was reported to be 0.99 for both lower limbs and this has been attributed to the strict body stabilization method, the well-defined end point of motion and accurate instrument placement

of the test.[9]

Flexibility has defined as ability of the muscles to lengthen and allow one joint to move through a range of motion that is influenced by muscles, tendon, ligaments and bones [16]It has also been documented that maximum popliteal angle (180 degrees) is measurable from birth to age 2 years after which it decreases steadily to an average of 155 degrees by age 6 years, and then remains steady. Dynamic soft tissue mobilization (DSTM) It is a soft tissue manipulation technique to restore a tissue's ability to cope with the load placed upon it result in lengthening (or) tightened muscle and fascia, normalize abnormal neuromuscular relationship, improve local circulation and restore joint mobility improving flexibility.[17]Self myofascial release (SMR) technique involves the objects such as foam roller or massage sticks, tennis ball, medicine ball to be rolled across a muscle group.[18] Self myofascial release is popular because it can be done by the athlete when active release or deep tissue massage is not available it claims to improve mobility and ROM reduce adhesions and scar tissue, and improve over all movement.[19]Active knee extension test [AKET] is reliable and valid scale will be used to measure hamstring tightness as part of orthopaedical assessment , with normal values of knee motion to within 20° of full extension being quoted.

METHODOLOGY

This study received institutional ethical approval from Outpatient department of jaya college of physiotherapy permission to recruit subjects and access to medical records were granted by the participating hospital and all participants provided informed written consent. Inclusion criteria were Asymptomatic subject, Age 18-25 years ,Males, >15° degrees active knee extension loss

Exclusion criteria includes Females patients, Fracture of the hip and knee. Dislocations of the lower limb hamstring injuries ,Hypermobility of the lower limb joint ,Nerve lesions of the lower limb, Subject suffering from low back pain in the last 2 months, Metal pins, plates, screws in the femur, Neurological abnormalities.

Total of 30 subjects with Hamstring tightness were taken by convenience sampling. All the subjects were explained about their condition & mode of assessment and written informed consent was obtained from them. Subjects were taken up for the study after they fulfilled the inclusion criteria. All subjects were evaluated prospectively in the Hospital. Active knee extension test using universal goniometer. Measure were assessed initially in the Hospital Outcome measures were reassessed after two weeks of first assessment: Functional measures were assessed using Active knee extension test using universal goniometer.

DATA ANALYSIS

The details collected from the questionnaire ICIQ-SF was entered in MS-Excel sheet and collected data was used for statistical analysis in the SPSS-20 software and the descriptive tabled were generated to demonstrate the findings. Paired T-test was used to compare the difference between the groups.

TABLE 1: ShowsTesting difference between right AKET Before and AKET right After for Dynamic Soft Tissue Mobilization (Group A)

t-Test: Paired Two Sample for Means		
	Pre Test	**Post Test**
	AKET_ RIGHT_1	**AKET_ RIGHT_2**
Mean	27.93	9.20
Variance	7.78	5.46
Observations	15	15
Pearson Correlation	0.0351	
Hypothesized Mean Difference	0	
Df	14	
t Stat	20.2945	
P(T<=t) one-tail	0.0000	
t Critical one-tail	1.7613	
P(T<=t) two-tail	0.0000	
t Critical two-tail	2.1448	

TABLE 2 showsTesting difference between AKET left Before and AKET left After for Dynamic Soft Tissue Mobilization (Group A):

t-Test: Paired Two Sample for Means		
	Pre Test	**Post Test**
	AKET_LEFT_1	**AKET_LEFT_2**
Mean	23.73	7.47

Cont... **TABLE 2: ShowsTesting difference between AKET left Before and AKET left After for Dynamic Soft Tissue Mobilization (Group A):**

Variance		8.78	8.27
Observations		15	15
Pearson Correlation		0.4851	
Hypothesized Mean Difference		0	
Df		14	
t Stat		21.2605	
P(T<=t) one-tail		0.0000	
t Critical one-tail		1.7613	
P(T<=t) two-tail		**0.0000**	
t Critical two-tail		2.1448	

Table 3: Shows Testing difference between AKET right Before and AKET right After for Myofascial Release Technique (Group B):

t-Test: Paired Two Sample for Means		
	Pre Test	**Post Test**
	AKET_RIGHT_1	**AKET_RIGHT_2**
Mean	25.733	8.200
Variance	12.638	6.171
Observations	15.000	15.000
Pearson Correlation	0.645	
Hypothesized Mean Difference	0.000	

Cont... **Table 3: Shows Testing difference between AKET right Before and AKET right After for Myofascial Release Technique (Group B):**

Df	14.000	
t Stat	24.947	
P(T<=t) one-tail	0.000	
t Critical one-tail	1.761	
P(T<=t) two-tail	0.0000	
t Critical two-tail	2.145	

Table 4: Shows Testing difference between AKET left Before and AKET left After for Myofascial Release Technique (Group B):

t-Test: Paired Two Sample for Means		
	Pre Test	**Post Test**
	AKET_LEFT_1	**AKET_ LEFT_2**
Mean	22.267	7.200
Variance	4.638	7.600
Observations	15.000	15.000
Pearson Correlation	0.111	
Hypothesized Mean Difference	0.000	
Df	14.000	
t Stat	17.655	
P(T<=t) one-tail	0.000	
t Critical one-tail	1.761	
P(T<=t) two-tail	0.0000	
t Critical two-tail	2.145	

Table 5 Shows Testing the difference between the efficacy of "Dynamic soft tissue mobilization" (Group A) and "Self myofascial release techniques"(Group B) in hamstring flexibility in terms of AKET Right:

Diff_AKET_R_A	**Diff_AKET_R_B**	**t-Test: Two-Sample Assuming Equal Variances**		
22	**15**			
15	**18**		**Diff_AKET_R_A**	**Diff_AKET_R_B**
17	22	Mean	18.73	17.53
16	19	Variance	12.78	7.41

Table 5 Shows Testing the difference between the efficacy of "Dynamic soft tissue mobilization" (Group A) and "Self myofascial release techniques"(Group B) in hamstring flexibility in terms of AKET Right:

15	23	Observations	15	15
23	15	Pooled Variance	10.10	
18	14	Hypothesized Mean Difference	0.00	
22	20	Df	28	
18	15	t Stat	1.03	
20	18	P(T<=t) one-tail	0.15	
15	18	t Critical one-tail	1.70	
22	15	P(T<=t) two-tail	0.3098	
13	15	t Critical two-tail	2.05	
20	18			
25	18			

Table 6: Testing the difference between the efficacy of "Dynamic soft tissue mobilization" and "Self myofascial release techniques" in hamstring flexibility in terms of AKET Left:

Diff_ AKET_L_A	**Diff_ AKET_L_B**		**t-Test: Two-Sample Assuming *Equal* Variances**		
20	20				
10	15			***Diff_AKET_L_A***	***Diff_AKET_L_B***
17	16		Mean	16.27	15.07
15	20		Variance	8.78	**10.92**
13	10		Observations	15	15
15	18		Pooled Variance	9.85	
13	14		Hypothesized Mean Difference	0.00	
18	15		Df	28	
19	17		t Stat	1.05	
20	10		P(T<=t) one-tail	0.15	
18	15		t Critical one-tail	1.70	
16	18		P(T<=t) two-tail	0.3041	
15	10		t Critical two-tail	2.05	
20	15				
15	13				

DISCUSSIONS

The present study intended to compare the efficacy of dynamic soft tissue mobilization versus self myofascial release technique for hamstring tightness in healthy males in terms of change in hamstrings flexibility.The sample of 30 subjects have been randomized into two groups in 1:1 ratio that is 50% of subjects received Dynamic soft tissue mobilization (Group A)and the remaining 50% of subjects received Self myofascial

release technique (Group B). The subjects undergone active knee extension test (AKET) to confirm the hamstring tightness and the measurement of the extension lag or active knee deficit (AKD) evaluated using goniometer. Participants received treatment 6 sessions of treatment for 2 weeks duration. Only the subjects who have an extension lag of 15° and more were included in this study. Group A subjects were given dynamic soft tissue mobilization for 2 weeks and Group B were given with self myofascial release technique using a foam roller for 2 weeks.In Group A, received Dynamic soft tissue mobilization shows improvement in hamstrings flexibility in terms of AKET Score Right Side. Based on statistical analysis using **Paired sample t test results**, AKET Score Right Side (t(14df) = 20.29, p = 0.000 < 0.05). The mean AKET score on right side before treatment is 27.93 and it is reduced to 9.20 after the treatment. There is **significant effect** of "Dynamic Soft Tissue Mobilization" in increasing hamstring flexibility in terms of AKET right side. Flexibility is key components for injury prevention and rehabilitation, which promotes performance, lessen the post-exercise soreness, and also improves coordination. [27] As we know Hamstring flexibility leads to development of hamstring strain, [28] patella tendinopathy, [29] patella-femoral pain, low back pain with altered posture, [30] and symptoms of muscle damage following eccentric exercise. [31] (15) Flexibility can be achieved by many static and ballistic stretching as well as proprioceptive neuromuscular facilitation. [32] In our study reported the similar findings in improvement of the hamstring flexibility, in the pre and post test results of Group A (Table :

3) shows the mean AKET score on left side before treatment is 23.79 and it is reduced to 7.47 after the treatment. There is **significant effect** of "Dynamic Soft Tissue Mobilization" in increasing hamstring flexibility in terms of AKET left side.

In our study reported the similar findings in improvement of the hamstring flexibility. In Group B, received self myofascial release technique shows improvement in hamstrings flexibility in terms of AKET Score Right Side. Based on statistical analysis using (Table 4) **Paired sample t test results**, AKET Score Right (t(14df)=24.95, p=0.000<0.005). The mean AKET score on right side before treatment is 25.73 and it is reduced to 8.20 after the treatment. Similarly by the (table-5) Group B the pre-test and post-test values of AKET left side (t(14df)=17.66, p=0.000<0.05).the mean AKET scores on left side before treatment is 22.27 and it is reduced to 7.20 after the treatment There is **significant effect** of "Dynamic Soft Tissue Mobilization" in increasing hamstring flexibility in terms of AKET right side

On comparing both dynamic soft tissue mobilization (DSTM) and self myofascial release technique (SMRT) there is no significant difference in AKET scores on both right and left side But both are equally significant in improving the hamstrings flexibility as individual techniques. By the (table-6) AKET right side (t(28df)=1.03, p=0.3098>0.005) the mean difference in AKET right between before and after treatment for group A is 18.73 and that group B is 17.53.By the (table-7) AKET left side (t(28df)=1.05, p=0.3041>0.005).the mean difference in AKET left between before and after treatment for group A is 16.27 and that group B is 15.07

This results of this study concludes that both dynamic soft tissues mobilization and self-myofascial release technique equally significant in improving the hamstring flexibility.

CONCLUSION

On the basis of analysis, both dynamic soft tissues mobilization and self myofascial release technique are individually effective on hamstring tightness subjects in terms of active knee deficit or extension lag through AKET scores.

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Estimation of Vitamin D Levels in Children with and without Early Childhood Caries – A Case Control Study

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ABSTRACT

Introduction: Deficiency in vitamin D during the development of both primary and permanent teeth leads to enamel hypoplasia, which is a significant risk factor of ECC. Enamel defects have retentive areas that lead to the bacterial plaque colonization, facilitating the progression of carious lesions.

Aim: To determine the association between the vitamin D level and the severity of Early Childhood Caries in children of age less than 72 months.

Materials and Method: A case control study was carried in 196 children. After obtaining informed consent, oral examination was done and a questionnaire was filled from parents. Venipuncture was done for the estimation of vitamin D levels in blood.

Result: Among the study population, children with type 2 ECC had lower level of vitamin D than the type 1 and type 3 ECC.

Conclusion: Within the limitation of the study, there is no significant association between the vitamin D levels and the three types of early childhood caries. However there is lower level of vitamin D level in the moderate to severe early childhood caries children.

Keywords: *Early childhood caries, Vitamin D, Children*

INTRODUCTION

According to AAPD, early childhood caries (ECC) is "the presence of one or more decayed (noncavited or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child 71 months of age or younger". In children younger than 3 years of age, any sign of smooth surface caries is indicative of severe early childhood caries (S-ECC). From age 3 through 5, one or more cavitated, missing (due to caries) or filled smooth surface in primary maxillary anterior teeth or a decayed, missing or filled score of ≥ 4 (age 3), ≥5 (age 4) or ≥6 (age 5) surfaces constitutes S-ECC. There is high prevalence of ECC (40.6%) in 0-3 year old children from rural areas of South India and there is a need to consider early diagnosis and specific preventive interventions[1]. Acs et al, 1999 reported that, following completion of comprehensive dental rehabilitation, children with ECC demonstrated the "catch up growth" phenomenon (weight gain).

Vitamin D deficiency during childhood causes delay in appearance of permanent dentition and creates problems in the sequence of teeth eruption. Vitamin D status in childhood also plays an important role in dental caries[2,3]. Deficiency in vitamin D during the development of both primary and permanent teeth leads to enamel hypoplasia, which is a significant risk factor of ECC[4,5]. Enamel defects are common in primary dentition[6,7] and teeth with enamel defects have retentive areas that lead to the bacterial plaque colonization, facilitating the progression of carious lesions[8].

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Though majority of population in India live in areas receiving ample sunlight throughout the year, vitamin D deficiency is very common in all the age groups and both the sexes across the country[9,10]. Vitamin D deficiency is common in infancy due to decreased dietary intake, religious practices, seasonal variation, practice of not taking the child out, increasing rate of exclusive breast feeding and low maternal vitamin D[11].

There are studies which support that children with severe ECC are deficient in important vitamins and nutrients, including vitamin D[12,13]. Hence this study was carried out to determine the association between the vitamin D level and the severity of Early Childhood Caries.

MATERIALS AND METHOD

This case-control study was carried out in the department of Pedodontics of Saveetha dental college, Chennai. The study protocol was approved by the institutional review board and ethical committee of Saveetha University (SRB/SDMDS12ORT22). The clinical trial was also registered in CTRI (REF/2015/10/009967). Total sample size of 196 were divided into two groups accounting 98 in each group.

Inclusion Criteria

Group I:

Children with early childhood caries

ASA 1 patient (healthy) and ASA 2 patient (mild systemic disease and no functional limitation)

Group II:

Children without early childhood caries

ASA 1 patient and ASA 2 patient

Exclusion criteria

Children aged equal or more than 72 months

ASA 3 or greater children (complex metabolic or medical disorder)

Parents were explained about the study, its benefits to the subject and society in general. The dentist recorded data related to the presence of decayed, missing and filled surface (dmfs); decayed, missing and filled teeth (dmft) and the severity of early childhood caries based on Wyne's classification[15] (Table 1) and AAPD criteria (Table 2).

Sample collections

After getting consent from the parents, 5ml of blood sample was collected from the participants by venipuncture by the experienced phlebotomist. The samples were transported to the diagnostic centers on the same day. Vitamin D levels were estimated using Chemiluminescence immunoassay method.

Statistical analysis

The collected data was analysed with SPSS 23.0 version. To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables. To find the significant difference between the bivariate samples in independent groups the Unpaired t-test was used. For the multivariate analysis the one way ANOVA with Tukey's Post-Hoc test was used. To find the significance in categorical data Chi-Square test was used. For statistical significance, p value of <0.05 was considered.

RESULTS

Among 196 study population, 98 in the children with early childhood caries and 98 children without early childhood caries comprising of 102 (52%) were males and 94 (48%) were females. 48 males and 50 females were without ECC and 44 males and 54 females were present with ECC. In 98 children with early childhood caries, 34 children have type 1 (mild to moderate) caries, 49 children have type 2 (moderate to severe) caries and 15 children have (severe) caries based on Wyne's classification whereas based on AAPD criteria 39 children have early childhood caries, 59 children have severe early childhood caries.

The vitamin D level in children was estimated in blood. The mean value of vitamin D level in children with ECC is 20.12±5.80 and in children without ECC is 20.74±6.38 (Graph 1).

In the study population there were 34 children with type 1 ECC; 49 children had type 2 ECC and 15 children with type 3 ECC. On comparing the vitamin D level among the different types of ECC, type 3 (severe ECC) had higher vitamin D level with the mean value of 21.70±5.32; type 2 (moderate to severe ECC) had lower

vitamin D level with the mean value of 19.18±6.20 whereas type 1 (mild to moderate) ECC had vitamin D level with the mean value of 20.78±5.31 (Graph 2).

Among 98 children, 39 children were with ECC and 59 children were with S-ECC. On comparing the vitamin D level among these two groups S-ECC had lower vitamin D levels than the ECC group (Graph 3).

In the total study participants, 142 (72.4%) children are consuming fish regularly whereas 54 (27.6%) children are not consuming fish regularly. In the control group 20.84% had regular consumption of fish whereas in case group 19.83% had regular consumption of fish.

In 196 children, 163 (83.2%) children are consuming egg regularly whereas 33 (16.8%) children are not consuming egg regularly. In the control group 21.18% had regular consumption of egg whereas in case group 20.00% had regular consumption of egg.

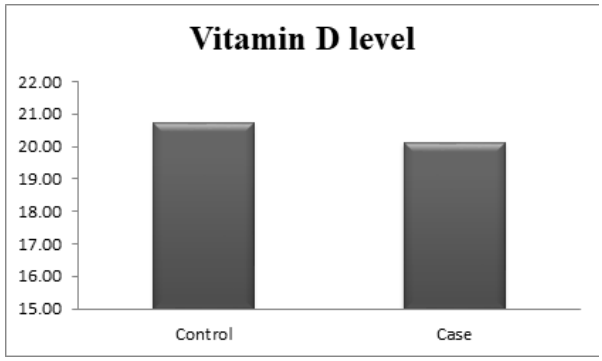
Among the total study participants, 51(26%) mothers had consumption of vitamin D during pregnancy whereas 145 (74%) mothers did not take vitamin D during their pregnancy. In the control group 19.76% had maternal consumption of vitamin D during pregnancy whereas in case group 21.93% had maternal consumption of vitamin D during pregnancy.

Among 196 children, 59 (30.1%) children are playing outside only in the day time; 85 (43.4%) children are playing outside only after the sunset whereas 52 (26.5%) children play outside both during day time as well as after the sunset.

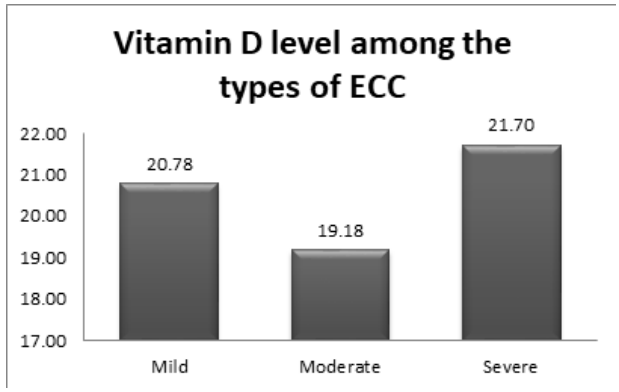
In 196 children, 129 (65.8%) children have daily sun exposure whereas 67 (34.2%) children do not have daily sun exposure. In the control group 21.42% of children had sun exposure whereas in case group 20.72% of children had sun exposure.

Among the total study participants, 20 children consumed multivitamins whereas 176 did not consume multivitamins.

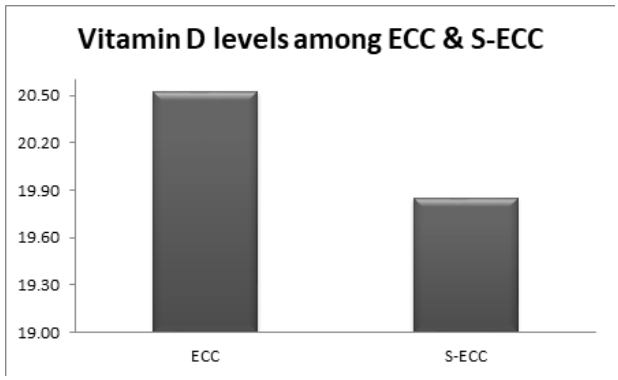
The association of oral hygiene habits and the feeding practices with the vitamin D level were given in table-3.



Graph 1: Vitamin D level in children with ECC and without ECC



Graph 2: Comparison of vitamin D levels among the 3 types of ECC (Wyne's Classification)



Graph 3: Comparison of vitamin D levels among the 2 types of ECC (AAPD Criteria)

Table 1: Wyne's Classification

Type I	Mild to Moderate ECC (Isolated carious lesion(s) involving molars and /or incisors)
Type II	Moderate to severe ECC (Labiolingual carious lesions affecting maxillary incisors with or without molar caries and unaffected mandibular incisors)
Type III	Severe ECC (Carious lesions affecting all teeth including lower incisors)

Table 2: AAPD Criteria

Early Childhood Caries (ECC)	Presence of one or more decayed, missing or filled tooth surfaces in any primary tooth in a child under the age of six
Severe Early Childhood Caries (S-ECC)	In Children < 3 yrs of age, any sign of smooth surface caries
	From ages 3-5, one or more cavitated, missing or filled smooth surface caries in primary maxillary anterior teeth
	dmft score ≥ 4 (Age 3) ≥ 5 (Age 4) or ≥ 6 (Age 5)

Table 3: OH Habits and Feeding Practices of the Participants

Characteristic		Control			ECC		
		N	Std Deviation	p-value	N	Std Deviation	p-value
Oral Hygiene Habits With Vitamin D Level							
Tooth brushing commencement	6-12 Months	37	19.97±5.90	0.359	24	19.75±4.44	0.728
	≥13 Months	61	21.20±6.67		74	20.23±6.20	
Adult supervision of tooth brushing	Yes	59	20.42±6.10	0.547	77	20.46±5.93	0.61
	No	39	21.22±6.85		21	18.85±5.25	
Use of fluoride supplements	Yes	18	20.99±6.37	0.853	7	17.74±7.98	0.0265
	No	80	20.68±6.43		91	20.29±5.62	
Feeding Practices With Vitamin D Level							
History of bottle feeding	Yes	32	18.85±5.82	0.041*	64	20.25±6.07	0.751
	No	66	21.65±6.49		34	19.86±5.34	
Sleeping with bottle during night	Yes	22	22.07±5.27	0.267	45	20.65±6.33	0.398
	No	76	20.35±6.65		53	19.65±5.33	
Consumption of sweets	Yes	71	20.55±6.48	0.644	81	20.08±5.97	0.910
	No	27	21.22±6.21		17	20.26±5.09	

DISCUSSION

Nutritional deficiencies of different metabolites and periods of starvation during dental development can result in enamel hypoplasia, which increases the risk for caries[16]. Individual biochemical factors such as serum vitamin D levels have been implicated as modifiers of the development of caries[17]. So this study was carried out to determine vitamin D levels in children with and without early childhood caries and to associate the vitamin D levels with the severity of ECC. To the author's knowledge this is the first study to associate the vitamin D levels and ECC in India.

In the present study, the vitamin D level in children with ECC is lower than in children without ECC. Children with Type 2 (moderate to severe) ECC have lower vitamin D levels than the other two types. There is no statistically significant difference in the vitamin D levels in children with ECC and without ECC after adjusting the races[13]. There is no statistically significant association between levels of vitamin D and caries after adjusting for age, sex, race, ethnicity, sugar consumption[18]. However on comparing the vitamin D levels in children with ECC and S-ECC, children with S-ECC have lower vitamin D levels than the children

with ECC. Children with severe ECC appear to be at significantly greater odds of having low vitamin D level compared to their caries free controls[12].

Findings reveals, both in children with ECC and without ECC, the regular consumption of fish and egg didn't affect the vitamin D level. Diet contributes only 10-15% whereas exposure to sunlight is the main source of vitamin D[19]. However dietary supplements might be required to meet the daily need for vitamin D in some group of people[20].

In this study, children without ECC on sun exposure did not influence the vitamin D level. Results also reveals that the children with ECC, on playing outside only after the sunset had lower vitamin D levels. Home bound individuals, women who wear long robes and head coverings for religious reasons and people with occupations that limit sun exposure are unlikely to obtain adequate vitamin D from sunlight[21,22]. Children require less sun exposure to produce sufficient quantities of vitamin D because of greater capacity to produce vitamin D than the older people[23].

This study reveals that the maternal consumption of vitamin D during pregnancy did not have any influence on the vitamin D level in children with or without ECC. But there seems to be a strong relationship between maternal and cord blood vitamin D status[24]. Adequate vitamin D intake during pregnancy is important for foetal skeletal development, tooth enamel formation and foetal growth and development.

Usage of vitamin supplements is more common in 2-5 years[25]. Whereas in this study, only 20 children used multivitamins and the multivitamin usage did not affect the vitamin D level in children with or without ECC.

Limitation: Improved matching of case and controls would have been more helpful in knowing the factors influencing the vitamin D levels in children.

CONCLUSION

Within the limitation of the study,

There is no significant association between the vitamin D levels and the three types of early childhood caries.

However there is lower level of vitamin D level in the moderate to severe early childhood caries children.

This study may help the pedodontist to understand the vitamin D status in children with and without early childhood caries in south India population.

Conflicts of Interest: Nil

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Clinical, Echocardiographic and Risk Profile of Five Hundred Cases of Dilated Cardiomyopathy in a Tertiary Care Centre: Our Experience

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ABSTRACT

Background: Cardiovascular ailment is a common manifestation in patients with co-morbidity like diabetes mellitus, hypertension, COPD, etc. and the incidence is gradually increasing. In this study we have evaluated the Echocardiography reports of the patients attending department of medicine and cardiology and documented the demographic data of the patients.

Material and Method: In this retrospective observational study**,** 500 Echocardiography reports were collected from the department of cardiology and the previous clinical history and demographic data were collected from the register. All the collected data were analyzed with Excel MS office, window 7 version.

Results: Out of 500 cases 293 cases were male and 207 cases were female. The youngest cases encountered were 3 years of age and the oldest was 87 years of age. ECG was within normal limit with sinus Tachycardia seen in 80 cases. LVH with strain in 206 cases mostly in Hypertensive LBBB / LAHB was seen in 106 cases, Nonspecific ST/T changes in 108 cases. 2D- echocardiography revealed mild LV systolic dysfunction, moderate LVsystolic dysfunction, severe systolic dysfuction and Mitral valve regurgitation was found 52, 145, 303 and 415 patients respectively.

Conclusion: Present study highlights significant burden of DCM in elderly population, especially males. These patients are more likely to have arrhythmia and embolic episodes. Certain echocardiographic parameters like Ejection Fraction and Left Atrial size were found to correlate with left ventricular parameters and thus may be useful in predicting prognosis in DCM. However, further multicentric studies are needed in order to find the associated features in DCM patients in India and to better elucidate the significance of different chamber dimensions.

Keywords: *Echocardiogram, Dilated cardiomyopathy, Hypertrophic obstructive cardiomyopathy, Peripartum cardiomyopathy, Restrictive cardiomypathy*

INTRODUCTION

American Heart Association definition[1] (Maron et al. 2006) describes cardiomyopathies as "a heterogenous group of diseases of the myocardium associated with mechanical and/or electrical dysfunction that usually (but not invariably) exhibit inappropriate ventricular hypertrophy or dilation and are due to a variety of causes and frequently are genetic. Cardiomyopathies either are confined to the heart or are part of a generalized systemic disorder often leading to cardiovascular death or progressive heart failure-related disability [1]." (Maron et al. 2006) Dilated Cardiomyopathy (DCM),

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whether primary or secondary remains the major cause of Chronic Heart failure[2] (Mann and Bristow, 2005). The DCM is by far the most common form of cardiomyopathy, comprising more than 90% of subjects referred to specialized centers[4] (Bristow et al. 2000) and is responsible for approximately 10,000 deaths and 46000 hospitalizations each year in United State of America (USA). The lifetime incidence of DCM is 36.5/ per 100,000 population. In India though comprehensive data is not available its prevalence is much more now than the previous decades. Increases in diameter of left ventricle in both systole and diastole with Low ejection fraction (<54%) or in simple term dilatation and dysfunction of the left ventricle constitute the syndrome of Dilated Cardiomyopathy and the Renin Angiotensin Aldosteron (RAAS) system are activated to rescue the failing circulation[5] (Falk and Hershberger, 2015). The Kidney often responds by retaining fluid (water) and sodium and fluid builds up in dependent parts, in lungs and other organs. The body becomes congested and the patients go to congestive Heart Failure.

DCM can produce no symptoms or subtle symptoms or in severe cases Congestive Heart Failure. The symptoms include progressive shortness of breath, easy fatigability, palpitation, dizziness, swelling of limbs and abdomen, orthopnea, PND, cough, Chest-pain, Pre-syncope and syncope etc.

In most of the cases DCM are Idiopathic, one third cases of Idiopathic DCM have family history of such disease, called familial DCM. Other causes of DCM includes poorly controlled Hypertension, Diabetes Mellitus, Viral myocarditis, Thyroid disease, Alcohol & Coccaine abuse, women after child birth (peri-partum DCM), valvular disease, Toxic drug to the heart like anti cancer drugs & others. Tachycardia for prolonged period can result in left ventricular dysfunction called Tachy-cardia induced Cardiomyhopathy which improves after tachycardia is corrected. Takotsubo Cardiomyopathy is a stress induced reversible Cardiomyopathy found in post menopausal women.

MATERIALS & METHOD

We have studied 500 cases of Dilated Cardiomyopathy attended / admitted to IMS & Sum Hospital in the last 6 years i.e. from August 2011 to August 2017. The cases presenting with cardiac symptoms; breathlessness, angina, palpitation, cough, syncope, swelling body etc were evaluated thoroughly. History of Diabetes mellitus, Hypertension, Ischemic Heart Diseases (IHD), Rheumatic Heart Disease (RHD), smoking, Alcohol intake, drug abuse, Myocarditis, family history of Hypertension, DCM, IHD, Diabetes mellitus were taken. After detailed clinical examination (Blood Pressure pulse, Height, Weight, JVP, Anaemia Oedema feet, signs of CHF, Basal Creps. Hepatomegally, Ascites, Cardiomegally, S3, S4 regurgitant murmers), the cases were subjected to detailed blood test (CBC, FBS, Lipid profile, Urea, Creatinine thyroid functions test liver function test, Troponin T Test - Pro Brain Natriuretic Petide tests. Where required.

Electrocardiogram, Chest radiogram, Echocardiogram with Colour Doppler mapping was done in all cases. 50 cases were sent for pulmonary function test where lungs pathology was suspected. Diagnosis of DCM was made by clinical findings, (Cardiography, S3, S4, TR, MR, Basal rales) ECG, (LVH, LBBB, Non-specific ST, T changes, Tachy-cardia, Chest radiograph (Cardiography, Hilar Congestion, Bilateral hydrothrox etc) and lastly Echo Cardiogram (Chamber dilatation, Global hypokinesia, Secondary MR, PAH & TR, Low ejection fraction, E/A ratio. LV dysfunction was classified as per American Society of Echo Cardiography 2005 criteria as follows:-

Mild Dysfunction – EF- 45 to 54%

Moderate Dysfunction – EF- 30 % to 44%

Severe Dysfunction – EF - < 30%

125 cases with severe LV dysfunction & CHF were admitted to ICU and indoor wards & treated with classical anti-failure treatment (ACE Inhibitors / ARB, Diuretics, Cardio selective Beta Blockers Digoxin; with other ancillary drugs. Other 375 cases were treated as out patients at Cardiology OPD with anti-failure, decongestive treatment. All the cases were followed up an regular basis at the Cardiology OPD & records were kept. Valvular disease cases and acute Ischemic cases were excluded from the study.

RESULTS

Out of 500 cases 293 cases were male and 207 cases were female. The youngest cases encountered were 3 years of age and the oldest was 87 years of age. Age distribution of the patients is given in table No-1. Female

predominance is seen up to 50 years of age (F=74, M=53) Male dominate the scene from 50 to 80 yrs of age (M=240, F=133 Type 2 diabetes mellitus was present in 42 cases. Hypertension in 69 cases, both diabetes & hypertension was present in 41 cases. Chronic Alcohol intake (50 gram/ day for > 5 years) seen in 12 cases. Peri partum Cardiomyopathy was seen is 3 cases. One case had Duchene's Muscular Dystrophy with DCM. Two cases had history of viral Myocarditis.

Associated CKD/CRF were founded in 13 cases mostly in diabetics, COPD was founded in 35 cases, CVA with Hemiplegia seen in 6 cases, cirrhosis of liver in 3 cases, history of anti cancer drug (Ca-Bronchous) seen in one case, Family history of DCM was found in 2 persons. Parkinsonism seen in these 2 persons. Benign Hypertrophy of Prostrate (BEP) found in 9 cases. Progressive shortness of breath was found to be the most common presenting symptom, followed by weakness, vertigo and chest pain. ECG was within normal limit with sinus Tachycardia seen in 80 cases. LVH with strain in 206 cases mostly in Hypertensive LBBB / LAHB was seen in 106 cases, Nonspecific ST/T changes in 108 cases. (Associates Atrial fibrillation in 10 cases, PSVT in 2 case & CHB in 2 cases) on followed up trial, 37 persons have expired in four years, 10 cases have fully recovered with LV EF went beyond 60% (2 peri-partum, 2 myocarditis, 6 Idiopathic cause).

2D- echocardiography findings in our study were, 52 patients had mild LV systolic dysfunction(EF 45-54%). 303 patients had moderate LVsystolic dysfunction (EF 30-44%), 145 patients had severe systolic dysfuction (EF<30%), Mitral valve regurgitation was found in 440 patients, Pulmonary artery hypertension and Tricuspid valve regurgitation was found in 415 patients, Diastolic Dysfunction A >E was observed in 455 patients.

Table – 1 Age / Sex Distribution

Age Group	Male	Female	Total
1 - 20Yrs	6	4	10
21 - 40Yrs	23	30	53
41 - 50Yrs	24	40	64
51 - 60Yrs	62	68	130
61 - 70Yrs	90	39	129
71 - 80Yrs	70	18	88
> 80 yrs	18	8	26
Total	**293**	**207**	**500**

Table – 2 Major Risk Factor Distribution

Risk Factor	Male	Female	Total
Diabetes mellitus	20	22	42
Hypertension	40	29	69
DM & HTN	21	20	41
Alcohol	12	-	12
Ischemic Heart Disease	8	5	13
Peri partium CM	0	3	3
MyoCarditis	0	2	2
Duchennes Muscular dystrophy	1	0	1
Functioning hypertrophy DCM	2	1	3
Anti Cancer drug	0	1	1
Family History of DCM	1	1	2

Table – 3: Conditions Associated with DCM

Risk	Male	Female	Total
COPD :	25	10	35
CKD / 1 :	8	5	13
Cirrhosis Liver :	3	0	3
CVA :	4	2	6
Parkinsonism :	2	0	2

Table – 4: Echo Findings

Mild LV Dysfunction EF(45 – 54)	52
Moderate LV Dysfunction EF (30 – 44%)	303
Severe LV Dysfunction (<30%)	145
Secondary MR	440
PAH with TR	315
Diastolic Dysfunction A >E	455

DISCUSSION

Out of 500 cases profiled, 293 cases were male and 207 cases were female, Similar finding has been reported from U.P., India, where the male: female ratio was 1.5:1 and 48% of the patients were above 60 years of age[7]. Female patients with DCM were seen up to 50 years of age (F=74, M=53) Males were found to be higher from 50 to 80 yrs of age (M=240, F=133). Similar male preponderance in DCM has also been reported in an European study by Rakar S et al.[6]

Ushasree B et al in an Indian study from Hyderabad reported that, smokers and alcoholics comprised almost 18 and 16% of DCM cases respectively[7]. Alcohol is the most common toxin implicated in chronic dilated Cardiomyopathy. In present series 12 cases were found to have chronic alcoholic. Three had cirrhosis of liver. In general, alcoholic patients consuming > 90gm of alcohol per day for more than 5 years have higher risk of developing DCM in the USA. The clinical diagnosis of alcoholic cardiomyopathy can be made when there is bi-ventricular dysfunction and dialatation is persistant in a heavy drinker without evidence of any other diseases. Hence it's a diagnosis of exclusion[8]. Toxicity of Alcohol is attributed to alcohol & its primary metabolite – Acetaldehyde, alcohol and its metabolites interfere with numerous membrane and cellular functions such as transport and binding of calcium, mitochondrial protein synthesis, excitation contraction coupling. It may also be due to associated thiamine deficiency or effect of preservative found in Alcohol[9].

With age, comorbidities like hypertension, diabetes, malignancy or renal failure increase. These may cause DCM and heart failure. In our study causative factors or Risk factors could be ascertained in 184 cases (36.8%) leaving 316 cases (63.2%) was Idiopathic DCM. Diabetes mellitus or Hypertension alone or both was found in 152 case (30.4%). In diabetes mellitus there is increase incidence of CHF. The etiologies of this abnormality is multi-factorial and include factors such as myocardial ischemia from atherosclerosis, hypertension, myocardial fibrosis and myocardial cell dysfunction secondary to chronic hyperglycemia Heart Disease in Hypertension is the result of structural & functional adaptation leading to LV hypertrophy, diastolic dysfunction followed by LV dilatation and CHF. There may be associated atherosclerotic coronary artery disease and micro-vascular disease. Chronic Ischemic Heart Disease can produce DCM (Ischemic Cardiomyopathy) due to Ischemic cell damage, Myocardial-Scarring, fibrosis, remodeling, dilatation of the ventricle & subsequent dysfunction. This group have better prognosis if ischemia is detected early and revascularization achieved in due time[5].

Three case of peripartum cardiomyopathy were found 6 months post delivery, 2 cases improved and one died. A number of recent studies have provided information regarding the incidence of PPCM in the United States, ranging from 1 in 1,149 to 1 in 4,350 live births with a mean of 1 in 3,186 live births[10]. The cause of such cardiomyopathy is uncertain however, prolactin may play a role through pro inflammatory mechanism. Immune pathogenesis is supported by a frequent finding of lymphocytic infiltration in biopsies. Multi-parity and previous exposures to fetal antigens are also found to be significant risk factors[11].

Presence of COPD with resultant increase in pulmonary artery pressure and right ventricle strain compounded the LV dysfunction further Chronic Kidney Disease or CRF with retaining of water precipitated CHF further. The progress is very unfavorable in these two group of cases.

Different ECG and echocardiographic findings are found in DCM patients. In one Indian study, they found ST-T changes in 90% cases, Left bundle branch block (LBBB) in 30% and atrial fibrillation in 5% of the cases[7]. ECG findings in our study were, sinus Tachycardia seen in 80 cases. LVH with strain in 206 cases mostly in Hypertensive LBBB / LAHB was seen in 106 cases, Nonspecific ST/T changes in 108 cases, Atrial fibrillation in 10 cases, PSVT in 2 case & CHB in 2 cases. De Maria et al[12] in 1992, found out that maximum cases of DCM had ECG findings of first and second degree heart block, LBBB, low voltage QRS complexes, and other findings were ventricular tachyarrythmias, and delayed intra-ventricular conduction[13]. C Matei et al from Romania [14], found presence of increased left ventricular end-diastolic diameter (LVIDD) and mitral regurgitation as risk factors for occurrence of AF[15].

CONCLUSION

This small observational study depicts the high prevalence of DCM in elderly population, especially males. These patients are more likely to have arrhythmia and embolic episodes. Certain echocardiographic

parameters like Ejection Fraction and Left Atrial size were found to correlate with left ventricular parameters and thus may be useful in predicting prognosis in DCM. However, further multicentric studies are needed in order to find the associated features in DCM patients in India and to better elucidate the significance of different chamber dimensions.

Ethical Clearance: This study is approved from our institutional ethics committee.

Source of Funding: Self

Conflict of Interest: Nil

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Interdependence of Communicable and Non-Communicable Diseases among Elderly Population in Declared Slum in Mysuru City, Karnataka

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ABSTRACT

Background: Indian Health Care delivery system is more deviant towards productive age groups and has sidelined the veterans who constitute about 7-8% of our population. Morbidities among elderly are largely preventable and treatable if detected at early stages. The complex interactions between established communicable and emerging Non-communicable diseases(NCD)among Elderly like Diabetes and Tuberculosis, emphasizing the importance of re-thinking disease classification in the context of Health promotion, disease prevention, treatment, and care.

Objectives: 1. To determine the prevalence of coexisting Communicable and Non Communicable Diseases among the Elderly population.

2. To assess the interdependence between Communicable and Non Communicable disease among the Elderly population.

Methodology: This cross-sectional study was conducted in a declared slum of Mysuru city for a period of one month. Socio-demographic characteristics, the prevalence of Communicable and Non Communicable Diseases and associated co-morbidities were collected in a pretested structured survey schedule by interview technique.

Results: It was found that out of total 106 study subjects, 25% had Diabetes, 36% had Diabetes and Hypertension and 39% had Hypertension. There was a significant association between Comorbidities and Infectious Diseases(p-value 0.001). There was a statistically significant association when we studied the interdependence between NCD and Infectious Diseases(p-value:0.002).

Conclusion: Increasing burden of Communicable disease with pre-existing Non-Communicable disease necessitates for evolving a strategy to include screeningfor these conditions in the regular health check up among elderly.

Keywords: *Geriatrics, Communicable disease, Non-communicable disease, Interdependence, Quality of life.*

INTRODUCTION

Non-communicable diseases (NCD) are a major Public health problem, responsible for a high proportion of deaths and disabilities. WHO estimated that, in 2000, NCDs caused 59% of deaths and 46% of the global burden of disease.[1] Based on available trends, by 2020 NCDs are predicted to account for 73% of deaths and 60% of disease burden.[2]

India's elderly population contributes 8.2% of the total population according to 2011 census and is projected to increase to 10.7 percent by the year 2021 and 20 percent in 2050.[3]

Advancement in medical sciences with

socioeconomic improvement across the country has led to increased life expectancy among Indians, which has resulted in the increased old-age dependency ratio. The Indian healthcare delivery system is more deviant towards productive age groups and has sidelined the veterans.

NCD is the leading cause of death globally. Older people are disproportionately affected. Non Communicable diseases among elderly are largely preventable and treatable if detected at early stages. Infectious Diseases among Elderly with NCD are the most common problems which decrease Quality of Life.

However, International development and global health policies and strategies rarely give adequate attention to NCD or recognize the links between rising NCD and population aging. Services, including health promotion and prevention, at all levels of the healthcare system, especially in primary health care, often fail to respond to the needs of aging populations, including the specific needs of older people.

The present study was done with the aim to know the prevalence of communicable and non-communicable diseases and their interdependence in the elderly population.

MATERIALS AND METHODOLOGY

This cross-sectional community-based study was conducted in a declared slum of Mysuru city, Medar's block for a period of one month(January to February 2017). As there were no similar studies done in the past, a prevalence of interdependence of communicable and non-communicable diseases among elderly was assumed to be 50%, required sample size with 5% absolute precision and confidence level of 95% and with 10% absolute allowable error was found to be 100. Considering the non-response rate of 5%, 105 elderly were included in the study. From the database of Urban Health Centre, 105 subjects aged 60 years and above were selected by simple random sampling method and data were collected by a house to house survey. The house where the selected elderly was out of station/not available at the time of data collection was revisited thrice before selecting next elderly subject from the database. Institutional ethical committee approval and Informed consent from the study participants were obtained prior to the start of the study. Data collected were entered and analyzed in SPSS version 22.Statistical analysis was done using Descriptive statistics like proportion and Inferential statistics like Chi-square test .P-value less than 0.05 was taken as statistically significant.

Inclusion criteria: ubjects aged 60 years and above with NCD

Exclusion criteria: Those who arenot present at home even after 3 visits and who were seriously ill

RESULTS

Among the study participants,74(69.8%) were between the age group of 60 - 69 years. 36(34.0%) were males and 70(66%) were females. Out of 106 Elderly 77 (72.6%) were illiterate, 20(18.9%) studied till middle class.83(78.3%) were married. Out of 106 elderly 39(36.8%) were consuming Tobacco, 56(52.8%) were in class II SES according to B.G. Prasad classification. 50(47%)were Obese and 30(28.3%) were overweight(Table 1).

It was found from the study that among 106 study subjects 27(25.5%) were having Diabetes, 41(38.7%) were having Hypertension and 38(35.8%) had both Diabetes and Hypertension.(Table 2). 105(99.1%) of the study subjects were on regular treatment.(Table 3).Out of 106 study subjects, 78(73.6%) were having Non Communicable diseases for a period of 2 to 10 years. (Graph 1). Among them, 38(36%) were not on adequate control.(Graph 2).

23(21.7%) did not have any comorbid condition, whereas, 34(32.1%) had Osteoarthritis, 13(12.3%) had Cataract, 11(10.3%) had Cardiovascular disease and Asthma each.(Graph 3). Out of 106 elderly, 68 (64%) were having Infectious Diseases among study subjects with NCD's, 24(22.6%)were having URTI, 18(17%) were having periodontitis and 13(12.3%) were having UTI.(Graph 4).

There was a significant association between the presence of Co-morbidities and NCD and Infectious disease (p-value:0.001).When we studied the association between NCD and Infectious Diseases there was a statistically significant association(p-value:0.002). (Table 4).

Table 1: SOCIO-DEMOGRAPHIC PROFILE OF STUDY SUBJECTS(n=106)

Variable	Category	Frequency(%)
Age (in years)	60-69	**74(69.8)**
	70-79	29(27.4)
	80&above	3(2.8)
Sex	Males	36(34)
	Females	**70(66)**
Education	Illiterate	**77(72.6)**
	Primary	9(8.5)
	Middle	20(18.9)
Marital status	Married	**83(78.3)**
	Widow	23(21.7)
Tobacco Usage	Yes	39(36.8)
Medical Insurance	Yes	4(3.7)
	No	**102(96.2)**
SES	Class I	4(3.8)
	Class II	**56(52.8)**
	Class III	40(37.7)
	Class IV	2(1.9)
	Class V	4(3.8)
BMI	Underweight	6(5.6)
	Normal	20(18.9)
	Overweight	30(28.3)
	Obese	**50(47.1)**

Table 2: DISTRIBUTION OF STUDY SUBJECTS BASED ON PREVALENCE OF NCD(n=106)

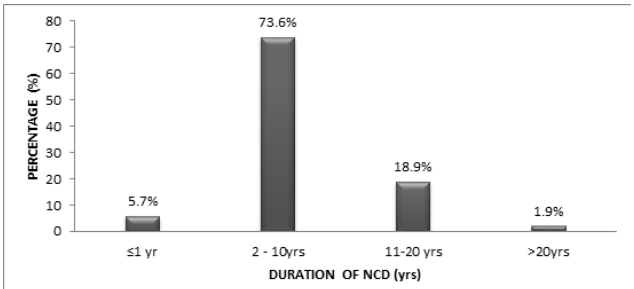
NCD	Frequency(%)
Diabetes Mellitus	27(25.5)
Hypertension	41(38.7)
Diabetes & Hypertension	38(35.8)
Total	**106**

Table 3: DISTRIBUTION OF STUDY SUBJECTS BASED ON PERCEIVED DRUG ADHERENCE

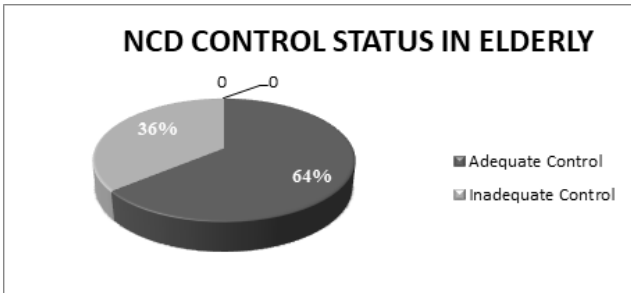
Regularity of Drug intake	Frequency(%)
No	1(0.9)
Yes	105 (99.1)
Total	**106**

Table 4: DISTRIBUTION OF STUDY SUBJECTS BASED ON ASSOCIATION BETWEEN CO-MORBIDITIES, NCDAND INFECTIOUS DISEASES

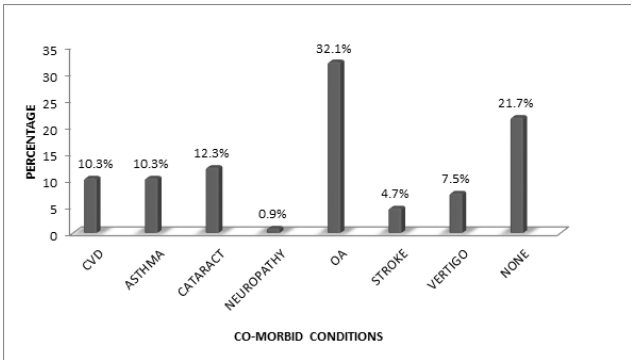
Variable	Category	Infectious Diseases		Total(%)	Chi Square	P Value
		No	Yes			
Co Morbid Conditions	CVD	5	6	11 (10.3)	47.221	**0.001**
	Asthma	2	9	11 (10.3)		
	Cataract	1	12	13 (12.2)		
	Neuropathy	1	0	1 (0.9)		
	OA	3	31	34 (32)		
	Stroke	1	4	5 (4.7)		
	Vertigo	8	0	8 (7.5)		
	None	16	6	22 (20.7)		
NCD	Diabetes	5	22	27(25.4)	12.337	**0.002**
	Hypertension	23	18	41(38.6)		
	Diabetes and Hypertension	10	28	38(7.5)		



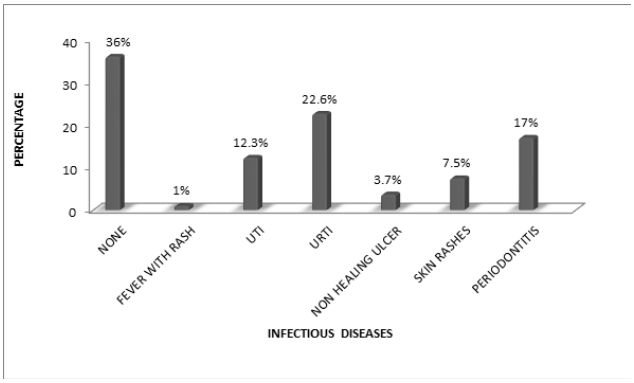
Graph 1: DISTRIBUTION OF STUDY SUBJECTS BASED ON DURATION OF NCD



Graph 2:DISTRIBUTION OF STUDY SUBJECTS BASED ON NCD CONTROL STATUS



Graph 3: DISTRIBUTION OF STUDY SUBJECTS BASED ON PREVALENCE OF CO-MORBIDITIES



Graph 4: DISTRIBUTION OF STUDY SUBJECTS BASED ON PREVALENCE OF INFECTIOUS DISEASES

DISCUSSION

Older age group are more likely than younger age group to have unrecognized comorbidities and impairments that increase their risk of medical morbidity and mortality.

In the present study out of 106 study subjects, 69.8% belonged to age group 60-69 years. A study conducted by Mohapatra et al on elderly showed 68.5% in the age group of 60-69 years.[4]

It was found in the study that among 106 study subjects, 27(25.5%) were having Diabetes, 41(38.7%) were having Hypertension and 38(35.8%) had both Diabetes and Hypertension. Globally, two out of three deaths are caused by NCD.[5] By 2020, NCD will account for 80 percent of the global burden of disease, causing seven out of 10 deaths in low- and middle-income countries.[6] However, International development and global health policies and strategies rarely give adequate attention to NCD or recognize the links between rising NCD and population aging. Increase burden of NCD in elderly are due to decreased immune status and "Age" itself is actually a universal risk factor for nearly every disease. It was found in the present study that 68 (64%) were having Infectious Diseases among study subjects with NCD, 24(22.6%)were having URTI, 18(17%) were having periodontitis and 13(12.3%)were having UTI. Although aberrations of host defence mechanisms with aging are thought to be the major risk factors for acquiring the infection, other general factors may be equally important, Uncontrolled Non Communicable disease status like Diabetes is also an important factor influencing it. When we studied the association between NCD and Infectious diseases there was a statistically significant association. (P value:0.002). There was a significant association on applying chi-square test between Co-morbidities with NCD and Infectious disease(P value:0.001).Studies conducted on Elderly have shown that many low- and middle-income countries lack trained health workers to respond to the complex, multiple and often interconnected healthcare needs associated with aging. Lack of access to appropriate health services – including NCD diagnosis, treatment, follow-up and referral where necessary – not only limits the life chances of those living with NCD, but also places a strain on those caring for them.[7] Experience in the HelpAge global network shows that, with training and education provided through older people's associations, older people can often manage NCDs themselves and facilitate Prevention of Infectious diseases.[8]

CONCLUSION

Elderly persons appear to be prone to more frequent or serious morbidity and higher mortality from infectious

diseases than the general population associated with the Non-communicable disease. It is important that clinicians be aware of these selected diseases as well as the risk factors for infection in Elderly population to prevent and control of Infectious diseases to improve overall Quality of Life.

Source of Funding: Self

Conflicts of Interest: Nil

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Intimate Partner Violence: Factors and Types of Abuse Women Face in and around Coimbatore District, Tamilnadu

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ABSTRACT

Intimate partner violence has become an important global public health problem. It is the most common form of violence against women in all over the world and is prevalent both urban and rural areas. Intimate partner violence is also termed as domestic violence. Women end up suffering severe physical, emotional and sexual abuse by their partner. Women suffer silently due to the fear of retaliation, lack of economic support, lack of support from family and friends and majorly due to the concern of their children. The risk factors of IPV operates at 4 levels, individual, relationship, community and societal. This study aims in understanding the risk factors influencing IPV and other types of abuse women undergo due to violence in and around the district of Coimbatore. We surveyed around 200 women out of which 78 women voluntarily agreed to participate in the one to one interview where a structured questionnaire was prepared to interview the women. The questionnaire consisted of questions to identify the socio economic and demographic status and causes of intimate partner violence. This study aims to find out and understand the effects of IPV the women face in our society and cohere it with social norms and values. The findings indicate that women suffer long term mental and physical health problems caused by intimate partner violence. If a woman has faced severe abuse it ends up having mental and physical impact over the women over a longer period of time.

Keywords*: Women, Abuse, Intimate partner violence, mental health, physical health, illiteracy*

INTRODUCTION

Intimate partner violence (IPV) is a preventable public health problem that affects women both in developed and developing nations. According to the World Health Organization IPV is defined as "behavior within an intimate relationship that causes physical, sexual or psychological harm, including acts of physical aggression, sexual coercion, and psychological abuse and controlling behaviors". IPV is also commonly referred to as domestic violence and it exist in different cultures and societies all over the world. IPV has an adverse effect on the mental and physical health of women [1] . The factors associated with IPV included early marriage, husband's alcohol use, women's employment to name a few. Causes of high frequency Intimate partner violence in India is driven by patriarchal societal norms which eventually causes women to be treated as their subordinates [2] . Other factors that associated with IPV are the cultural practice of obtaining dowry during weddings, growing up by witnessing violence, controlling behavior of the husband and social demography like age, low level of education, harmful use of alcohol and drugs, acceptance of violence and area of residence. Women in general suffer silently fearing many factors like fear of retaliation, lack of alternate financial support, lack of support from family and friends and concern for their children. In general partner violence affects whole family [3]

The prevalence of IPV is seen in all settings, regions, and religious groups. Although there are some dissimilarity in reporting by region, studies show that

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women in southern part of India report lesser physical abuse than in women from northern part of India[4]. According to the national survey 8% of married women have been subjected to sexual violence, 31% have been physically abused in a way such as slapping or pinching and 14% of Indian women have experienced psychological abuse in throughout their lives [5] . Couples disparities in educational level, marital age, dowry pressure, poverty, alcoholism are highly associated with IPV in India [6] .

The studies from various south Asian countries on IPV have identified a number of risk factors like age, education level, low income, poverty, occupation, and controlling behavior of spouse are associated with IPV which may lead to different types of abuses too. For example. Babu and Kar[7] stated that age, education, occupation, marital duration and husband's alcoholism emerged as significant predictors of victimization and perpetration of all types of domestic violence. Meanwhile Atteraya, et.al [8] determined that female illiteracy, low economic status, violent family history and a lack of decision making were associated with intimate partner violence. In a family back ground husband's alcoholic dependency, husbands education level, and more number of children were factors associated with violence. However, the issue of IPV is still remaining in India.

This paper is on study of IPV and its risk factors for women respondents with their characteristics such as age, education, occupation, number of years of marriage and different types of abuses faced by women.

METHOD

Qualitative approach was used to carry out the study. This was carried out in two stages among the people of Coimbatore district; Tamil Nadu, India. In first stage around 200 houses were visited and the survey was done door to door. Out of the 200 houses visited around 78 women had agreed to participate in the study. These women felt comfortable to participate in the survey and hence were chosen for the 2nd stage of the study. These 78 women were interviewed one on one with open ended questions using a semi structured questionnaire ensuring them adequate privacy during the stage 2 of the study. The questionnaire consisted of the socio-demographic characteristics of both women and her partner i.e., age, education, employment status, monthly income per month, marital status, religious background, number of people in the household, number of years of their marriage, factors influencing partner violence and other types and frequencies of abuse these women underwent. These women were also asked about their spouse's alcohol use. This interview was carried out over a span of 4 months based on the participant's convenience. After the structured interview was completed, the data was assessed.

RESULTS

The collected data from the survey was analyzed on the participant's socio demographics, risk factors of IPV and the types of abuse the women underwent. Based on our study, figure 1 shows that around 29.49% of women are in the age group of 31-35. 24.36% are in the age group of 26-30 and 24.36% are in the age group of 36-40. 10 % are in the age group of 20-25. 6.41% of women fall in the age group of 41-45 and 5.12% belong to the age group 46-50. Different parameters featuring the educational level of the respondent from figure 1 we can infer that majority of women 65.39% only higher secondary school level education, 14.10% have college level education and 11.54% are still pursuing education in college. 8.97% of the women have completed their diploma. It is interesting to note that less educated women faced higher odds of IPV. Apart from this we also found that 51.28% of women were house wives and 37.18% were working as teacher, nurse, and beautician. Few women were employed in other sectors too. 11.54 % of the women were still continuing their studies. Based on this study we can infer that women's dependency creates more chances of violence whereas independent working women had faced less risk of partner violence. However we also studied the number of years of marriage between the couples where we found that majority 43.59% of the couples have been married for 1-5 years, 35.90% of the women were married for 6-10 years and 10.26% have been married for 11 years.

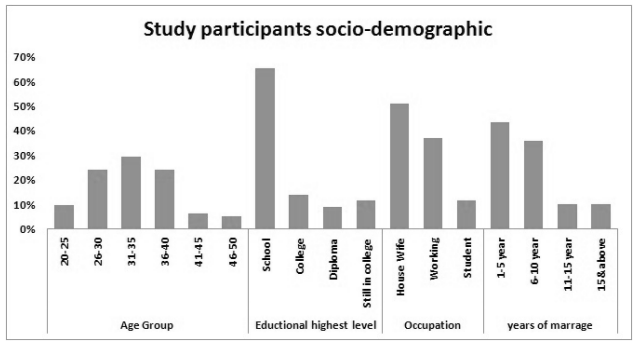

Figure 1: Study of participants' social demography

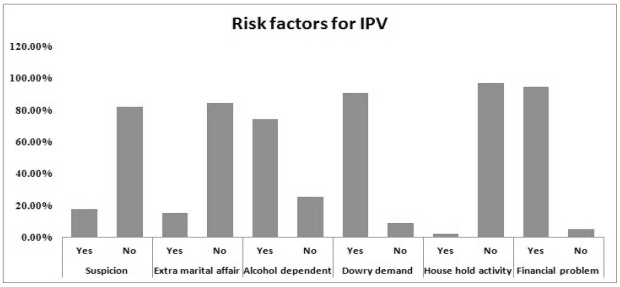

Figure 2: Risk factors involved with Intimate Partner Violence

Figure 2 shows the risk factors involved with IPV. From the graphs we can infer that 91.03% of the women had faced problem due to dowry demand. 74.36% of women abuse due to alcohol addiction in the husbands. Alcohol addiction in the men have led to conflicts in the house causing both physical and mental abuse in the women. These women end up sustaining a lot of physical injuries like bruises, broken bones etc. Victims of alcohol abuse were not confined to women alone but it also had been affecting the children in these families. Similarly we can interpret from our study and the graph that 94.87% of women underwent abuse due to financial crisis in a family. 17.95% of the women faced physical and mental abuse due to suspicion and 15.38% of women suffered as their husband had extramarital affairs.

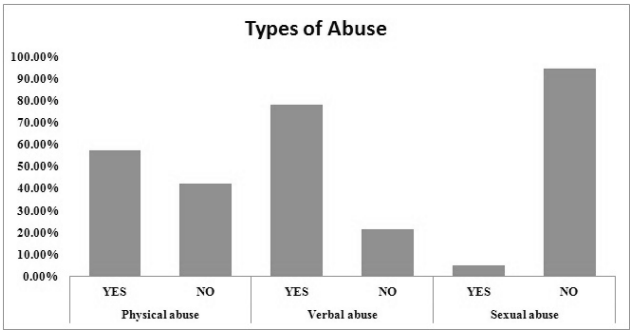

Figure 3: Different types of abuse women face

From figure 3 we can understand the different types of abuse the women underwent. From the graphs we can infer that majority of the women i.e., 78.21% of the women underwent verbal abuse. Consequently we can see that around 57.70% faced physical abuse like slapping, kicking, pinching and around 5.13% of the women had faced sexual abuse. From the study we can understand that IPV is still prevalent in the district of Coimbatore and is prevalent in both educated and uneducated population. We can infer that women are subjected to different forms of abuse both physical and mental and this has led to affecting the women psychologically.

DISCUSSION

The factors influencing IPV have been previously documented from countries in and around Asia, Africa and America with different political, economic and cultural differences. The result of the study indicated that IPV is still prevalent and the victims are women in general. From this study we have found that age, education, occupation status of women, and marital duration have influenced IPV in women in the district of Coimbatore. However in studies conducted by Babu and Kar [7] stated that factors like age, education, occupation, marital duration and husband's alcoholism are significantly associated with higher odds of all types of violence .Atteraya, Gnawali, Song, [8] and Bhatta [9] in Nepal has highlighted the factors associated with IPV. The study showed that female illiteracy, low economic status, violent family history and a lack of decision making were associated with intimate partner violence in Nepal . The husband's alcohol dependency and husband's education level also associated with IPV in Nepal.

The findings revealed that alcohol dependency, dowry demand and economic dependency are the high risk factors for IPV. However a study by Kaur and Garg [10] stated that alcoholism in husband is the main cause for violence against women. Similarly Jennifer A. Wagman et.al [11], Nair [12], Ramadugu [13] stated that alcohol is the high risk factor for IPV and maltreatment of women. Similar studies conducted by Slabbert [14], Atteraya, Gnawali and Song, [8] mentioned that women faced abuses in lower economic groups. He also stated that poverty is associated with IPV.

Currently, verbal abuse was found to be the most common form of IPV in (78.21%) followed by physical abuse in (57.70%). A study carried out in Bangladesh stated that physical and sexual abuse was highest in rural districts than in slums. Likewise, verbal and physical abuses are at higher rates in urban districts, when compared to sexual abuse. The findings in the study highlight the complex nature of various factors that influence IPV. In this context we would like to bring into light that women are trapped into the cultural framework, molded by patriarchal system of our country which happens to be the highest risk factor involved with IPV. These results needed more information to assess the situation to give interventions as well as provide the awareness among women about the existing law.

CONCLUSION

Gender role and cultural norms contributes to partner violence. Therefore interventions need to be done in the legal and institutional level, which concentrates more on partner and relationship issues. There is a need to provide successful interventions for reducing alcohol use and strategies for women and help them protect themselves from alcohol related IPV. The IPV prevention program targeting men should include spousal abuse, alcohol use, and sexual behavior as social and public health problems and also insert the sociocultural context within which men who abuse their partners. Even female illiteracy, low economic background, childhood experiences and husband's education level and occupation influence the partner violence. In order to promote equality further study should be conducted in future to focus on male behaviors. Various researches suggest that physical and psychological abuse affect the health of the women adversely. For abused women there should be health care protocols and also screening for treatment of IPV related abuses. Thus intervention provides social support and reduces stress among abused women. Studies have stated that if the woman is suffering from any psychological disorder they should also evaluate for domestic violence. The government should undertake stringent measures to ensure gender equality and should maintain zero tolerance in bringing the perpetrator of Intimate partner violence to justice. Women's civil rights related to divorce, property, child support and custody needs to be strengthened. Economic and social empowerment of women needs to be promoted and at school level boys and men should be engaged to promote nonviolence and gender equality. These reforms might reduce the cases of IPV and help empower women rather than victimizing them.

Ethical Issues: This study obtained consent from the women before involving them in this study and informed about the importance of the study.

Source of Funding: Self

Conflict of Interest: Nil

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Stress Level and Coping Strategies of IT Sectors

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ABSTRACT

Effective stress management, on the other hand, helps you break the hold stress has on your life, so you can be happier, healthier, and more productive. The main aim of this study is to find out the various factors contributing to stress among IT peoples and the impact of the stress among employees. The researcher used chi-square test and t-test to find the results. It finds that work load is the main factor that causing stress followed by technology and multi task. Team work and management pressure causing less stress compared with other factors. Finally, it concludes that management takes lots of techniques such as, arranging tours, awards, appreciation and monetary motivations to avoid stress among the employees and to achieved the goals.

Keywords: *Stress, IT culture, coping strategies, monetary motivations.*

INTRODUCTION

Stress management is a wide spectrum of techniques and psychotherapies aimed at controlling a person›s level of **stress**, especially chronic **stress**, usually for the purpose of improving everyday functioning. Stress management starts with identifying the sources of stress in your life. This isn't as straightforward as it sounds. While it's easy to identify major stressors such as changing jobs, moving, or a going through a divorce, pinpointing the sources of chronic stress can be more complicated. It's all too easy to overlook how your own thoughts, feelings, and behaviours contribute to your everyday stress levels.

Effective stress management, on the other hand, helps you break the hold stress has on your life, so you can be happier, healthier, and more productive. The ultimate goal is a balanced life, with time for work, relationships, relaxation, and fun—and the resilience to hold up under pressure and meet challenges head on. But stress management is not one-size-fits-all. That's why it's important to experiment and find out what works best for you. The following stress management tips can help you do that.

Stress has becoming significantly with the result of dynamic social factors and changing needs of life styles. Stress is man‘s adaptive reaction to an outward situation which would lead to physical mental and behavioural changes. Brain cells create ideas, Stress may kills brain cells. The truth is that not all stresses are destructive in nature. Appropriate amount of stress can actually trigger your passion for work, tap your latent abilities and even ignite inspirations.

Stress is a fact in our daily life. When a person needs help, it means the person feels physically and emotionally disabled. Most people believe that their capacity and capabilities are so little to encounter high level of stress. Most people think that they know the stress. The reality is that, stress is complicated and it is not well perceived. To know how the stress works and affects on our lives, first, we describe it and then study its relationship with organisational life.

Challenge will give mental and physical energy to person and stimulate him to learn new skills in his job field. Therefore, a challenge in a workplace is a constructive and an important factor for health and productivity (Norcross & Prochaska, 2007, p. 78).

Organizational strategies to prevent occupational stress are quite simple; they involve the creation of a suitable working environment in terms of employment characteristics, labor relations, organizational structure and achievement of a healthy organizational culture. Companies have realized the usefulness of anti-stress programs by looking at the reduction of medical costs for their employees. The latest programs of this kind

are the so-called "wellness programs" designed to take care of both the physical and psychological aspect of the employee.

The work stress is found in all professions, the very affected are the IT professionals who are highly target driven, highly pressured on results, and are squeezed both physically and mentally to the maximum on their roles and loads. The stress is manifested in various ways and means, and the much prone sector is the IT sector, which has turned upside down only their working hours, but also their biological system, which affects at three different levels viz., individual, interpersonal and organizational level. Devoid of stress, a person becomes sluggish and boring. Positive stress encourages a person to achieve better. However, if this stress exceeds beyond the required level it causes distress.

To cope up this situation the IT Management are taking many steps to reduce the stress of their employees such as arranging outstation, conducting games among the employees, providing facilities, holidays etc.,

REVIEW OF LITERATURE

Jac J.L. van der Klink, Roland W. B. Blonk, Aart H. Schene,(2001), The Benefits of Interventions for Work-Related Stress, American Journal of Public Health. 2001;91:270–276). This study is to determine the effectiveness of occupational stress–reducing interventions and the populations for which such interventions are most beneficial. Forty- Four intervention types were distinguished: cognitive–behavioral interventions, relaxation techniques, multimodal programs, and organization focused interventions. A moderate effect was found for cognitive–behavioral interventions and multimodal interventions, and a small effect was found for relaxation techniques. It concludes that Stress management interventions are effective Cognitive– behavioral interventions are more effective than the other intervention types[1].

Mihaela STOICA,(2010), CCUPATIONAL STRESS MANAGEMENT OCCUPATIONAL STRESS, Management in health XIV/2/2010; pp. 7-9, Stress management is an important part of maintaining good physical and emotional health and healthy relationships with others. This article presents some strategies to prevent and reduce stress both at the organizational level as well as individually. With rare exceptions, Romanian stress Management programs have not known a great success, the reasons behind this being related to mentality. The occupational stress problem in Romania is still an open question, waiting to be solved[5].

Laiba Dar,Anum Akmal, Muhammad Akram Naseem,Kashif Ud Din Khan(May 2011), Impact of Stress on Employees Job Performance in Business Sector of Pakistan. Global Journal of Management and Business Research Volume 11 Issue 6 Version 1.0, The main aim of this study to examine the relationship between job stress and job performance. The chi-square test and t-test was used to test the hypothesis. The findings showed that job stress brings about subjective effects such as feeling undervalued and workplace victimization/ bullying, unclear role/errands, work home interface; fear of joblessness, exposure the traumatic incidents at work and economic instability among our target population. Resulting in poor concentration, mental block and poor decision making skills. Based on these findings, it was recommended that organizations should reduce psychological strain, work overload and role ambiguity through adoption of job redesign techniques. Furthermore, the study explores the employees job performance with demographic variables, resulting that male employees are highly stressed vis-à-vis their female counterparts[3].

Uma Devi .T(OCT 2011) A Study on Stress Management and Coping Strategies With Reference to IT Companies, Journal of Information Technology and Economic Development 2(2), 30-48, October 2011 30. The focus of the paper is to study the stress level among IT employees and to suggest the coping strategies. A survey of 200 IT employees in the IT companies situated in and around Hyderabad is done. Some of the stress coping strategies identified by this study includes stress management programs, physical activities planned in job design, life style modification programs, finding triggers and stressors, supportive organization culture, stress counseling programs, and spiritual programs[9].

Ramezan Jahanian, Seyyed Mohammad Tabatabaei(Nov 2012) Stress Management in the Workplace, International Journal of Academic Research in Economics and Management Sciences, ISSN: 2226-3624.The nature of working has been changed widely, and still these changes are in progress. Following these changes, number of illnesses has been increased, morality and human aspects are faded and new problems

are occurred every day, so that we are facing job stress which called "illness of the century"[6].

Soni Kushwaha(2014),Stress Management At Workplace, Global Journal of Finance and Management. ISSN 0975-6477 Volume 6, Number 5 (2014), pp. 469-472, This paper will discuss various techniques of stress management at workplace, measures to reduce workplace stress and interventions when sources of stress cannot be eliminated[8].

Dr. Latha Krishnan(May 2014), Factors Causing Stress among Working Women and Strategies to Cope Up, IOSR Journal of Business and Management (IOSR-JBM) e-ISSN: 2278-487X, p-ISSN: 2319-7668. Volume 16, Issue 5. The main aim of this study have identified socio-economic stressors, psychological and family and relationship stressors causing stress among working women and strategies to cope up with it. Statistical tools like factor analysis and regression coefficient were used to develop Structural Equation Model. The findings of the study reveal that under socio-economic stressors unexpected guests, followed by absence of domestic help causes major stress among working women. Similarly being perfectionist with unnecessary worries which cause psychological set back among working women. Moreover anxiety about children future and husbands job insecurity play a major role in causing stress under family and relationship[4].

Sanjeev Kumar, J. P. Bhukar(Jan 2013), Stress level and coping strategies of college students, Journal of Physical Education and Sports Management, Vol. 4(1): pp. 5-11. The aim of this study was to investigate the stress levels and coping strategies of professional students belonging to Physical Education and Engineering professions. A sample of 60 subjects was randomly selected from the Physical Education and Engineering Institute, India. Two way analysis of variance (ANOVA) showed that stress due to all the stimuli was significantly higher among girls in comparison to boys of their profession. Coping strategy was higher in boys than girls of their respective profession, but Physical Education girls had higher coping strategy than boys and girls of Engineering. Therefore, it can be concluded that Physical Education students had better coping strategy than engineering students[7].

Dr. A. Jayakumar, K. Sumathi(2014), An Empirical Study on Stress Management for Higher Secondary Students in Salem District-Tamil Nadu. International Journal of Recent Advances in Organizational Behaviour and Decision Sciences (IJRAOB) (ISSN: 2311-3197) 2014 Vol: 1 Issue 1. The study mainly focuses on higher education students. The students suffer from stress on some level. It mainly based on empirical study. The samples include higher education students. The research instruments are questionnaire method. This research focuses on stress perception stressful experiences and stress management in studies of students. The learning strategies required to manage stressful situations in order to improve their performance[2].

Unnikrishnan.P (Feb 2015),Management Of Stress And Motivation Of Employees, International Journal Of Research – Granthaalayah ISSN- 2350-0530(O) ISSN- 2394-3629(P). The concept of motivation can be effectively used to remove stress from our organization .Different motivational techniques such as financial incentives, appreciation, personal encouragement, training and development programs ,seminar & workshops etc. will helps to throw away stress from organizations, if complete stress had been removed ,and motivation is given, a complete & strategic organizational change will takes place in organization[10].

OBJECTIVES OF THIS STUDY

The specific objectives of the study are:

1. To identify the various factors contributing to stress among IT peoples.
2. To identify the impact of the stress among employees.
3. To find out the management techniques used by IT management.

HYPOTHESES OF THIS STUDY

1. There is no significant difference among the factors causing stress between the IT peoples.
2. There is no significant relationship between stress management techniques and impact of employees.

IMPACT OF STRESS IN THE WORK PLACE

1. Low involvement in their work.
2. Poor performance
3. Lack of interest

4. Memory Loss
5. Unnecessary Arguments
6. Poor co-operation
7. Tension
8. Absenteeism
9. Misbehaviour
10. Resigned attitude

MANAGEMENT TECHNIQUES TO REDUCE STRESS

1. Convenient time
2. Arrange tours
3. Conducting games
4. Appreciations
5. Awards
6. Promotions
7. Monetary Motivations
8. Maintain good relationship among employees
9. Developing healthy life styles.

RESEARCH ANALYSIS

The researcher used chi-square test and t-test to find the results. After analysing national and international journals there are many factors causing stress among the IT peoples. The main factors are job rotation, technology, work load, competition, IT culture, multi task, Management pressure, team work, job loss and various commitments. The following table shows that the relationship between age and income of IT peoples.

Table - 1 Age * Income Crosstabulation

Count

		Income				**Total**
Less than 15,000		**15,000-35000**	**35,000-50,000**	**Above 50,000**		
Age	25-30	35	15	0	0	50
	Above 31	0	0	62	88	150
Total		**35**	**15**	**62**	**88**	**200**

Source: computed data

Table – 2 Chi-Square Tests

	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	200.000[a]	3	.000
Likelihood Ratio	224.934	3	.000
Linear-by-Linear Association	160.607	1	.000
N of Valid Cases	200		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 3.75.

Source: computed data

In view of the above, it can be presumed that the Pearson chi-square = 200.000 p=.000 are statistically significant at the 5 % level. This implies that age of the employees is an important criterion for the employees. The income of the employees varies depends upon their age.

FACTORS CAUSING STRESS AMONG THE IT PEOPLES

The researcher framed ten factors that are intimately connected stress among IT peoples. These dimensions are composed of 'n' no. of variables that are needed to be reduced systematically without affecting their representations on the population parameters. Therefore,

the researcher appropriately applied Factor Analysis by principal component method to reduce the variables into predominant factor:

This construct consists of 8 variables in Likert's five point scale which ranges from "Strongly Agree" to "Strongly Disagree". The application of Factor Analysis brought the following results:

Table - 3 T-test for stress

	N	Mean	Std. Deviation	Std. Error Mean	t-value lower	Significance Lower	Rank
Job rotation	200	2.67	1.284	.091	2.49	2.49	7
Technology	200	3.36	1.027	.073	3.21	3.21	2
Work load	200	3.37	.952	.067	3.23	3.23	1
competition	200	2.86	1.281	.091	2.68	2.68	4
IT culture	200	2.66	1.391	.098	2.47	2.47	8
Multi task	200	2.90	1.152	.081	2.74	2.74	3
Management pressure	200	2.49	1.051	.074	2.34	2.34	9
Team work	200	2.47	1.056	.075	2.32	2.32	10
Job loss	200	2.86	1.262	.089	2.68	2.68	4
Commitments	200	2.76	1.113	.079	2.60	2.60	6

Source: computed data

From the above table it can be found that the mean values range from 2.47 to 3.47 with the respective standard deviation and standard error. The t values 2.49, 3.21, 3.23, 2.68, 2.47, 2.74, 2.34, 2.32, 2.68, 2.60 are statistically significant at the 5 % level. Therefore, it can be concluded that among the ten factors work load is the main factor for stress among the employees in IT sector.

FINDINGS AND CONCLUSIONS

There are various factors causing stress in the IT sectors. The main factors are job rotation, technology, work load, competition, IT culture, multi task, Management pressure, team work, job loss and various commitments. Apart from these ten factors work load is the main factor that causing stress followed by technology and multi task. Team work and management pressure causing less stress compared with other factors

Competition and job loss gets equal points that create stress among the IT peoples. The management avoids Job rotation of the employees to reduce stress. Finally, it concludes that management takes lots of techniques such as, arranging tours, awards, appreciation and monetary motivations to avoid stress among the employees and to achieved the goals.

TESTING OF HYPOTHESES

There is no significant difference among the factors causing stress between the IT peoples - Rejected

There is no significant relationship between stress management techniques and impact of employees – Rejected.

Conflict of Interest – Nil

Ethical Clearance – Taken from UGC Committee

Source of Funding- Self

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Factors Affecting Dental Attitudes of the Adults of South India: A Cross Sectional Study

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ABSTRACT

Objective: This study evaluates various factors which can influence the dental attitude of adult patients towards their dental health and care. **Material and Method:** It was a cross-sectional study consisting of self-administered structured questionnaire on patients' dental attitude as well as socio demographic variables completed by 377 patients; mean age 34.3 years recruited from the dental centers of Manipal College of Dental Sciences in Udupi Taluk, Karnataka, India. Frequency distribution analysis and chi-square test was used to compare between categorical variables. **Results:** The good dental attitude were significantly found in subjects those belonged to urban places ($p<0.001$), had higher SES ($p=0.003$), had better financial capacity ($p<0.001$), were able to pay the bills comfortably (<0.001), were satisfied with their dentists ($p<0.001$) and those believed in having personal responsibility in taking care of their oral health ($p<0.001$) than their counterparts ($p<0.001$). The poor dental attitudes were significantly found in subjects those agreed that cost had influenced their treatment in the past ($p<0.001$), those believed to get over any dental problem by itself ($p<0.001$) and eventually losing their teeth regardless of the efforts ($p<0.001$), those had cynicism towards dentists and dental care ($p<0.001$) and those dental treatment didn't work out well ($p<0.001$). **Conclusion:** Health promotion strategies focused on changing the dental attitudes of patients based upon these determinants can achieve better compliance of the patients towards dental health advice and care.

Keywords: *Factors, Determinants, Dental, Attitudes, Adults*

INTRODUCTION

Dental attitude can be explained as attitudes and beliefs of the people that might affect their oral health behaviors, dental attendance, utilization of dental services and treatment choices[1-3]. Attitudes are mostly formed from person's past experiences and may affect their readiness to modify present behavior. There are several factors that can influence dental attitudes of the people such as perceived health, importance of oral health, nature of the doctor-patient interaction, quality of recent dental care and cost of the treatment[3, 4]. These factors can be considered as the psycho-social determinants of health attitudes as they might play major role in the development of health attitudes and behaviors[5, 6].

Self-care health practices are the most effective measures for preventing oral diseases yet a large proportion of the population fails to sufficiently adopt or maintain adequate oral hygiene behavior. This is because patients' health beliefs and attitudes influence patients' motivation to perform health behaviors, to seek treatment and adhere to dentists' advices. It also explains why several oral health programs fails to bring a change in the oral health behaviors of people, as, they are mostly not centered on the development of dental health attitudes and perceptions[5, 6]. Learning about these determinants can help to understand the issues related to patients' compliance or reluctance to adhere to dental

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health advice.

It is therefore important to study and understand various factors which may play role in influencing dental attitudes of the patients. Also, identification of the difficulties faced by the patients to comply with dental health advice or care can provide solutions to dental health care providers to overcome them. This study evaluates various factors which can influence the dental attitude of adult patients towards their dental health and care. It will also be needful for some outreach programs to focus on these factors to change dental attitudes of people with the ultimate goal of preventing disease and promoting oral health.

MATERIAL AND METHOD

The present study was a cross sectional survey conducted among 15-70 years aged subjects visiting dental outreach centers of Manipal College of Dental Sciences in Udupi district, Karnataka, in the Southern part of India. The ethical clearance to conduct the study was obtained from the Institutional Ethics Committee. The patients were recruited in the waiting area before their appointments. All subjects were briefed about the purpose and process of the study and informed consent was sought for the self-administered questionnaire. A pilot study was done on 20 subjects before the commencement of the study in order to assess the feasibility of the study. The sample size required to carry out the study was taken 384 subjects (maximum) after assuming the prevalence at 50%, confidence level at 95% (Z, standard value of 1.96) and margin of error at 5% (d, standard value of 0.05) considering around 10% refusal or incomplete responses, the sample size was fixed at 430. The questionnaire was distributed to 430 patients, out of which 377 patients returned the completed questionnaire with the acceptable response rate of 88%. Patients below the age of 15 years, illiterate and those not willing to participate were excluded from the study.

The self-administered questionnaire consisted of variables regarding socio-demographics such as age, gender, location, income, marital status, education, religion and occupation with two additional questions on patients' financial capability and ability to pay bills. Age was categorized as ≤ 32 years and ≥ 33 years after considering the median. The location of the respondents was categorized into urban or rural. The Kuppuswamy scale was used to calculate the socioeconomic status by adding education, occupation and income of the study subjects. It was categorized into upper class, middle class (upper middle + lower middle) and lower class (upper lower + lower) [7]. The dental attitude of the subjects was assessed using a twenty nine item modified attitudinal questionnaire[4]. It consisted of eight factors assessing influence of costs on past dental treatment, eventuality of dental decline, effectiveness of dental care, cynicism towards dentists and dental care, quality of recent dental care, personal influence on oral health, importance of preventing dental problems and frustration about dental care. The individual item were rated on five-point Likert scale ranging from "strongly disagree" to "somewhat disagree", "neutral", "somewhat agree" and to "strongly agree". Few of the items had their scoring reversed to avoid response set bias. The range of the scores derived from attitudinal questionnaire was divided into three equal divisions; based upon which study population was grouped into three categories of subjects with poor attitude, good attitude and very good attitude. Kannada is the regional language of Karnataka; hence, its English version was translated and adapted into Kannada. It involved the forward translation from English to Kannada and then independent backward translation from Kannada to English by two qualified English-to-Kannada translators.

STATISTICAL ANALYSIS

The analysis of the study was carried out using the Statistical Package for Social Sciences (SPSS 11.5 version). Frequency distribution analysis and chi-square test was used to compare between categorical variables. The cut-off level for statistical significance was taken at <0.05.

RESULTS

Table 1 shows the distribution of study population based on their socio-demographic variables. There was an approximately equal distribution of the study sample with respect to gender, age and location of the subjects. Majority of the study population belonged to middle SES (61.8%) and lower SES (35.3%). Nearly, three fourth of the subjects had low financial capacity and reported to have difficulty in paying the bills. The greater number of study subjects were found to have good dental attitudes (64.2%). The study subjects those belonged to urban places ($p<0.001$), had higher SES

(p=0.003), had better financial capacity (p<0.001) and were able to pay the bills comfortably (<0.001) were found to have significantly better dental attitudes than their counterparts.

The subjects those agreed that cost had influenced their treatment in the past had significantly poorer dental attitudes than those who disagreed to it (p < 0.001). It was found that subjects those believed to get over any dental problem by itself and believed coming to dentist only in pain and eventually losing their teeth regardless of the efforts were found to had significantly poorer dental attitudes as well (p<0.001). Almost all the study subjects (95%) had faith in dentistry and effectiveness of dental care. The subjects those had cynicism towards dentists and dental care had significantly poorer dental attitudes as well (p<0.001). The subjects those received good quality of recent dental care and were satisfied with their dentists had significantly better dental attitudes (p<0.001). The subjects those believed in having personal responsibility in taking care of their oral health (p<0.001) and felt very important to visit dentist had significantly better dental attitudes as well (p<0.001). The subjects those dental treatment didn't work out well were very frustrated with dental care and had poorer dental altitudes (p<0.001).

Table 1: **The distribution of study population based on socio-demographic variables**

Variables		**% (n)**
Gender	Male	51.2% (193)
	Female	48.8% (184)
Age	≤32 years	53.3%(201)
	≥33 years	46.7%(176)
Location	Urban	49.3%(186)
	Rural	50.7%(191)
Marital status	Married	65.8% (248)
	Single	34.2%(129)
SES*	Lower	35.3% (133)
	Middle	61.8% (233)
	Upper	2.9% (11)
Financial Capacity	cannot make ends meet	50.1%(189)
	manage to get by	31.3%(118)
	enough plus extra	10.1%(38)
	money is not a problem	8.5%(32)
Ability to pay bill	able to pay comfortably	25.2%(95)
	with difficulty	42.7%(161)
	not able to pay	32.1%(121)
Religion	Hindu	75.3% (284)
	Christian	18.3%(69)
	Muslim	5.3%(20)
	others	1%(4)
Attitude	Poor	29.2 % (110)
	Good	64.2%(242)
	Very Good	6.63%(25)
	Total	100%(377)

Cont... **Table 1**: **The distribution of study population based on socio-demographic variables**

n= number of participants

*SES (Education + Occupation +Income) as per Kuppuswamy SES scale

DISCUSSION

Dental attitudes and beliefs of the people about oral disease and the importance of preventive and curative oral care can certainly bring about differences in the quality of oral health among them[4, 8]. The most important concern noticed with poorer dental attitudes subjects is that they usually ignore their dental health and delay seeking dental care until oral disease becomes more severe which require more invasive, complex and expensive treatment[1-3]. Hence, it necessitates the need to study various factors which can influence the dental attitudes of people. This study was an attempt to know various factors affecting dental attitude of adult patients towards their dental health and care. A number of factors that positively affected dental attitudes for adult patients in the study were urban location, higher socio economic status, better financial capacity, ability to pay bills comfortably, recent good quality dental care, satisfaction with dentists' behavior and optimism about personal and professional oral care.

A large number of studies have agreed that urban participants have greater awareness, better knowledge and understanding of dental problems and higher oral health-seeking behavior[9, 10]. Similarly, in the present study, urban participants were found to have better dental attitudes than rural participants. The variation in the dental attitudes of urban and rural population of India can be mainly attributed to their differences in lifestyles, socioeconomic status, affordability and availability of treatment facilities. The affordability of dental care services had always been one of the important negative factors influencing the dental attitudes of people[11, 12]. In addition to high cost of dental care, lower socioeconomic status adds greater financial constraints for the patients to comfortably attain the treatment and so, brings reluctance in them. The best measure to address these issues is to increase awareness among people to adopt self-care practices as most of the dental diseases are preventable. Additionally, government sectors should take initiatives to address these problems by taking necessary actions.

Beliefs about perceived control over health are considered to be an important motivational factor for understanding an individual's likelihood of adopting health-promoting behaviors[6, 13]. The locus of control belief is an important determinant of whether or not a patient takes responsibility for their oral healthcare. Individuals with a high internal locus of control believe that events result primarily from their own behavior. Those with a low internal locus of control believe that powerful others, fate, or chance primarily determine events[14]. In the present study also, subjects those had believed in having personal control over their oral health had better dental attitudes than subjects those believed to get over any dental problem by itself, believed coming to dentist only in pain and believed in eventually losing their teeth regardless of the efforts. Oral health professionals should enable people to understand the importance of oral health and develop self-efficacy by providing them information on health and by facilitating skills development.

Previous dental health care experiences, whether good or bad, will affect the individual's mind set for further dental treatment[15]. It was noticed in the present study as well, that study participants those were cynical about dentists and dental care and were frustrated had poorer dental attitudes than participants those received good quality of recent dental care. Dentist should enquire about such traumatic or negative experiences of the patients and should educate, counsel and allay their fears. A trustful relationship with patients can be built by two-way communication, expressing concern and empathy, demonstrating competence and ethics.

CONCLUSION

Dental attitudes of a people may be considered as proxy indicator of their oral disease, self-care practices and dental health care services utilization. Peoples' attitudes, perceptions and behaviors are based on their life experiences and events. Oral health professionals should enable people to develop positive dental attitudes by education and provision of good dental care services with concern, empathy, competency and ethics. Moreover, health promotion strategies focused on changing the dental attitudes of patients based upon these determinants can achieve better compliance of the patients towards dental health advice and care.

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Regional Dimensions of Health Status of Children in Haryana

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ABSTRACT

Children are the future of tomorrow and potential efficiency and development of the nation depends on their health and it is prime responsibility of every nation to provide essential as well as better facilities and excellent flanking milieu to its nascent future. The present study is based on secondary data collected from District Level Household and Facility Survey –III. Pearson's correlation coefficient has been used to calculate the degree of association between child health and its major determinants. It has been revealed the considerable segment (13.0 per cent) of child population of the state is isolated from good health indicators. The common but avoidable incidences of diarrhea, infectious diseases and vitamin deficiencies are widely prevalent and children are suffering from lack of iron, malnutrition and partial vaccination which cause irretrievable damage in their future life.

Keyword: *Health, Nutrition, Efficiency Immunization, Diarrhea, and Vitamin Deficiency.*

INTRODUCTION

The children fitness is an important aspect of the development of society at micro and macro level. The health and nutritional needs of children are crucial to the well-being of whole nation since they are prime asset for progression and failure to develop their potential will certainly be the loss of the nation.(1) In fact, meager nutrition during childhood makes a long-term impression in terms of poor physical and mental growth of the children. The kids are naturally innocent, reliant and susceptible and inappropriate care during infancy causes malnutrition which refers to both under and over-nutrition. It may also lead to starvation, reducing the work competence and abridged the intellectual and communal growth. (2) WHO itself stated that effective learning practice necessitates good quality health. (3) The freedom from starvation and malnutrition is a basic human need for civilization and its mitigation is essential for society's development. In present time, malnutrition has become leading health dilemma and crucial communal health impasse in developing countries like India. It influences the growth prospect and increases the risk of death and morbidity in later days of life. (4) It is estimated that one hundred fifty million children (26.6 percent) are underweight while one hundred eighty-two million (32.5 percent) are stunted at global level. (5) In context to India, children health is not satisfactory as different types of undernourishment and deficiencies of macro and micronutrients are the major concerns and seem like silent crisis. Among 150 million undernourished children of the world, one in every three belongs to India. (6&7) In Haryana also child population is facing many health plights as infant (21 per 1000 population) and under-5 mortality rate (52 per 1000 population) are high. About 40 percent children suffer from various degree of malnutrition and 72 percent are anemic. More than one-third proportions (40.4 percent) of children are not fully immunized. (8) So it is a matter of concern that even after having graceful place among economically and agriculturally developed states in the country as well as being famous for its healthy food habits why Haryana is failed to give reputed health standards to its prospects.

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Study Area

Haryana is a land locked state and one of the economically most developed states of the nation, it is also recognized as a state having lowest sex-ratio (879 females per 1000 males) in the country (Census of India, 2011). It came into existence on 1st of November 1966 with covering an area of 44,212 square kilometers which comprises the 1.34 percent of total area of the country.

OBJECTIVES

The present study aims at realizing the following set of objectives:

- To study the spatial pattern of child health in Haryana at district level.
- To examine the shaping factors of health status of children and identify the existing relationship between child health and its various determinants.

MATERIAL AND METHOD

The present study is based on secondary sources of information collected from District Level Household and Facility Survey –III (DLHS-3) relates to year 2007-2008 and has been published in 2010. The following indicators have been used to measure the health status of the children:

- Suffering and treatment of acute respiratory infections (ARI) with in last two weeks (under 3 years).
- Suffering and treatment of diarrhea within last two weeks (under 3 years).
- Breast feeding practices (under 3 years) within one hour, within 24 hour and after 24 hour of the birth.
- Fully immunization/vaccination (12-23 months).
- Vitamin 'A' intake at least one dose (12-23 months).
- ORS awareness among women.

Pearson's correlation coefficient has been computed to gauge the degree of association between child health and its major formative factors.

RESULTS AND DISCUSSION

Suffering and Treatment of Acute Respiratory Infection (ARI)

Acute Respiratory Infections (ARI) is the most serious sickness among pre-school children at universal level and every child may suffer from five to eight attacks of ARI infections annually. [9] The study shows that more than 90 per cent children of five districts namely Ambala, Yamunanager, Kurukshetra, Karnal and Fatehabad whereas 80-90 per cent children of districts Panchkula, Kaithal, Jind, Hisar, Sirsa, Panipat, Sonipat, Rohtak, Gurgaon and Mewat suffer from ARI. The low prevalence of these infections is found in Bhiwani, Mahendergarh, Jhajjar and Rewari districts. The high incidences of treatment of ARI have been observed in Panchkula, Ambala, Yamunanager, Karnal, Sonipat, Bhiwani, Rewari and Gurgaon districts. In nine districts (Sirsa, Fatehabad, Hisar, Jind, Rohtak, Panipat, Kurukshetra, Mahendergarh and Faridabad) the ARI infections has been treated with in last two weeks averagely 80-90 per cent and only in two districts Jhajjar and Mewat ARI treatment is found below 80 per cent. The highest proportion of 98.4 per cent in Panchkula followed by 97.1 per cent in Rewari and 96 per cent children in Kaithal get treatment from ARI (Table 1).

Suffering and Treatment of Diarrhea

Diarrhea infection has third rank of childhood death in India, and it is to blame for thirteen percent of all deaths and sickness per year in pre-school children of world. [10] In 2013, nearly five lakhs and seventy thousand children below the age of five years passed away from diarrhea in world whereas one lakh and thirty thousand were related to India. [11] The regional variation shows that high occurrence of diarrhea has been traced in two districts i.e. Yamunanager and Karnal. There are moderate diarrhea incidences in Panchkula, Ambala, Kurukshetra, Panipat, Jhajjar, Mewat and Faridabad whereas in eleven districts of western and south-western Haryana has reported low cases. The treatment of diarrhea within last two weeks has been found high only in three districts namely Yamunanager, Kaithal and Jhajjar whereas in Ambala, Kurukshetra, Bhiwani, Rohtak, Mahendergarh, Gurgaon and Mewat districts, diarrhea handling have been found below 15 per cent. The rest of Haryana has shown moderate attention towards curing the problem of dehydration in children.

Breastfeeding Practices

The mother milk is measured as a complete food for the physical and mental growth of child and colostrums (thick, yellow milk of mother just after delivery) increase the anti-biotic capacity of children particularly during early years. [12] As recommended by the WHO, breastfeeding should be initiated immediately after birth and should be continued up to a minimum of six months. All over, there is not much awareness about commencement of breast milk in the state. The spatial pattern reflects that in Rewari and Sirsa districts more than 25 per cent women begins breastfeeding within one hour of the birth whereas in six districts namely Panchkula, Ambala, Kurukshetra, Rohtak, Rewari and Gurgaon this practice is adopted within twenty four hours of the birth.

In Yamunanager, Karnal, Panipat, Sonipat districts of eastern Haryana as well as in Jind, Fatehabad, Palwal and Mewat less than 15 per cent newborns receive mother's milk within one hour of the birth whereas in fifteen out of twenty districts (whole northern and eastern districts of study area including Sirsa, Hisar, Rohtak, Mahendergarh, Rewari, Gurgaon and Faridabad districts) of the state, mother's start to feed their children after twenty four hours of the birth.

Immunization Coverage

The full vaccination of child covers BCG, three doses of DPT, three doses of polio vaccine and measles against the six somber but vaccine preventable diseases (VPDs) (diphtheria, whooping cough, tetanus, tuberculosis, polio and measles). The immunization against these ailments has received maximum attention of child health care policy makers in India [13&14] however yearly five lakhs deaths are caused by VPDs in India. [15] These are interrelated as well as cyclic infections of formative years of children which provide a space to one another to be start. The figure demonstrates that in eight districts specifically Yamunanager, Ambala, Kaithal, Karnal, Sonipat, Rohtak and Gurgaon, more than 70 per cent children has been covered under full vaccination target whereas the minimum covering of complete vaccinated children (below 60 per cent) has been traced in six districts i.e. Panipat, Jind, Hisar, Bhiwani, Mewat and Faridabad. In Ambala district, highest 79.1 children have received full vaccination while district Faridabad is on bottom with 46.4 percent (Table 1).

Vitamin 'A' intake

Vitamin 'A' deficiency (VAD) is a concerning health and nutrition predicament in the rising countries like India. [16] The insufficiency of Vitamin 'A' costs night blindness and morbidity and transience from infections in early days of children. About 5.7 percent children in India endure this problem. [17 & 18] The statistics shows that high intake of Vitamin 'A' has been traced only in three districts (Karnal (78.4 per cent), Panchkula (73.9 per cent) and Sonipat (70.2 per cent) while 50-60 per cent children of Ambala, Kurukshetra and Yamunanager districts receive this most necessary quantity. It has been documented that instead of above said six districts, in entire state the intake of at least one dose of Vitamin 'A' is below 50 per cent and it is matter of great concern (Table 1).

ORS Awareness among Women

Oral rehydration solution (ORS) is defined as water solution with specific amount of salt and sugar and is used to control the liquid and solid loose in the body. The effectiveness of this concoction mainly depends on mother's awareness about its cleanliness, quantity and repetition during early phase of diarrhea instigation among infants. The regional variation exposes that in northernmost district Panchkula, westernmost district Sirsa in addition to Rohtak, Rewari and Gurgaon districts, more than 25 per cent women are found aware about ORS. The highest knowledge with 63.5 per cent value has been registered in Rewari district followed by Gurgaon (61.1 per cent) and Rohtak (59.1 per cent) districts (Table 1).

The moderate responsiveness (15-25 per cent) is observed only in Ambala and Kaithal districts while in rest thirteen districts (Yamunanager, Kurukshetra, Karnal, Panipat, Sonipat, Fatehabad, Hisar, Jind, Bhiwani, Jhajjar, Mahendergarh, Mewat and Faridabad) less than 15 per cent women are conscious about ORS. In Mewat and Faridabad districts women are found least aware about ORS drink i.e. 16.6 and 33.5 per cent respectively. Though there is considerable difference between knowledge and application of rehydration mixture yet awareness absolutely affects in positive manner to mitigate any type of disease.

Child Health and its Determinants

The health of the children is directly or indirectly

shaped by a number of socio-economic determinants. Generally, the prevalence of poor child health incidences is intimately correlated with low level of mother's education and pathetic fiscal position of family.

Table: 1 Selected Indicators of Child Health in Haryana

Sr. No.	Districts	% of Breast feeding within one hour of Birth	% of Breast feeding within 24 hour of Birth	% of Breast feeding after 24 hour of Birth	Vitamin 'A' intake at least one dose (12-23 months)	% of children aged 12-23 months Fully Vaccination	Treatment of Acute Respiratory Infections (ARI) with in last two weeks (under 3 years)	% of Children Suffered from ARI	% of Children Suffered from Diarrhea	Treatment of Diarrhea within last two weeks (under 3 years).	% of Women Aware of ORS
1	Ambala	19	69.3	30.7	65.9	79.1	91.2	13.8	15.1	74	50.8
2	Bhiwani	24.1	47.6	52.4	44.5	58.4	95.2	4.1	12.1	81.3	37.8
3	Faridabad	10.9	53.1	46.9	28.7	46.4	84.6	4.1	19.8	80.6	33.5
4	Fatehabad	10.8	40.3	59.7	45	62.8	89.7	10.1	9.3	81.4	29.2
5	Gurgaon	17.6	67.8	32.2	49.5	70.5	94.7	8.5	8.9	77.1	61.1
6	Hisar	23	63.4	36.6	44.6	55.8	82.4	5.6	11.7	79.7	38.7
7	Jhajjar	15.7	49.9	50.1	42.8	64.8	79.3	5	17.1	95	42.7
8	Jind	12.1	37.7	62.3	57.1	55.4	88.1	7	14.7	88.3	40.5
9	Kaithal	18.5	58.1	41.9	56.3	72.5	96	7.6	12.1	98.3	52.8
10	Karnal	7.8	54.6	45.4	78.4	75.2	91.5	14.6	33.4	88.3	39.4
11	Kuruksherta	18.8	67.9	32.1	67.2	67.8	82.7	14.9	22.8	79.5	43.2
12	Mahendragarh	23.3	61	39	52.4	67.7	82.4	2.8	13.9	76.7	42.3
13	Mewat	7.5	29.2	70.8	7.9	11	75.9	9.1	23	74.8	16.6
14	Palwal	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
15	Panchukala	19.7	70.5	29.5	73.9	78.1	98.4	9.8	15.7	97.5	56
16	Panipat	12.3	52.8	47.2	54.9	57	87	9.2	22.1	85.6	37.8
17	Rewari	33.3	74.8	25.2	54.1	67.3	97.1	4.9	9.5	86.5	63.5
18	Rohtak	20.3	70.9	29.1	46.8	75.7	88.4	8.2	11.5	74.5	59.1
19	Sirsa	27.5	57.2	42.8	59.6	61.3	88.5	5.6	7.5	87.8	55.7
20	Sonipat	8	63.3	36.7	70.2	73	94.2	7.3	13.5	83.7	44
21	Yamunanagar	8.5	57.1	42.9	61.5	70	94.8	13.1	26.8	88.1	42.5

Source: District Level Household and Facility Survey- III, 2007-08.

Note: DNA (Data not available)

Correlation matrix demonstrates that breast feeding within one hour of the birth, at least one dose of Vitamin 'A' intake, full immunization, treatment of acute respiratory infections within last two weeks, women awareness about ORS and female literacy have positive and significant correlation with child health indicators.

The social standard (caste) of the family is strongly positively associated with Vitamin 'A' intake and full vaccination of children. As in deprived social community lack of education and awareness, poor availability and expenditure on nutritious food, improper food allocation at household level are mainly responsible factor for appalling child health.

Table: 2 Correlations Matrix

Health Indicators	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9	X^{10}	X^{11}	X^{12}	X^{13}	X^{14}	X^{15}	X^{16}
X^1	1	0.547*	-0.547*	0.097	0.266	0.202	-0.435	-0.630**	-0.006	0.629**	0.179	0.063	0.25	-0.078	0.223	-0.062
X^2	0.547*	1	-1.000**	0.553	0.728**	0.449*	0.105	-0.235	-0.02	0.819**	0.736**	-0.570**	0.179	-0.565**	0.259	0.053
X^3	-0.547*	-1.000**	1	-0.553*	-0.728**	-0.449*	-0.105	0.235	0.02	-0.819**	-0.736**	0.570**	-0.179	0.565**	-0.259	-0.053
X^4	0.097	0.553*	-0.553*	1	0.837**	0.591**	0.452*	0.126	0.392	0.531*	0.562**	-0.249	0.545*	-0.751**	0.247	0.267
X^5	0.266	0.728**	-0.728**	0.837**	1	0.634**	0.257	-0.154	0.281	0.729**	0.772**	-0.42	0.537*	-0.743**	0.391	0.404
X^6	0.202	0.449*	-0.449*	0.591**	0.634**	1	0.142	-0.228	0.374	0.608**	0.477*	-0.182	0.339	-0.506*	0.089	0.14
X^7	-0.435	0.105	-0.105	0.452*	0.257	0.142	1	0.585**	-0.043	-0.05	0.119	-0.058	0.271	-0.602**	-0.287	-0.053
X^8	-0.630**	-0.235	0.235	0.126	-0.154	-0.228	0.585**	1	0.088	-0.460*	-0.061	-0.136	-0.218	-0.086	-0.424	0.022
X^9	-0.006	-0.02	0.02	0.392	0.281	0.374	-0.043	0.088	1	0.229	0.105	0.055	0.205	-0.294	0.307	0.179
X^{10}	-0.629**	-0.819**	0.819**	-0.531*	-0.729**	-0.608**	0.05	0.460*	-0.229	1	0.644**	-0.313	0.257	-0.473*	0.402	0.007

Cont... **Table: 2 Correlations Matrix**

X^{10}	0.629**	0.819**	-0.819**	0.531*	0.729**	0.608**	-0.05	-0.460*	0.229	1	0.644**	-0.313	0.257	-0.472*	0.403	-0.007
X^{11}	0.179	0.736**	-0.736**	0.562**	0.772**	0.477*	0.119	-0.061	0.105	0.644**	1	-0.766**	0.141	-0.598**	0.365	0.275
X^{12}	0.063	-0.570**	0.570**	-0.249	-0.42	-0.182	-0.058	-0.136	0.055	-0.313	-0.766**	1	0.27	0.349	-0.136	-0.196
X^{13}	0.25	0.179	-0.179	0.545*	0.537*	0.339	0.271	-0.218	0.205	0.257	0.141	0.27	1	-0.632**	0.227	0.405
X^{14}	-0.078	-0.565**	0.565**	-0.751**	-0.743**	-0.506*	-0.602**	-0.086	-0.294	-0.472*	-0.598**	0.349	-0.632**	1	-0.131	-0.281
X^{15}	0.223	0.259	-0.259	0.247	0.391	0.089	-0.287	-0.424	0.307	0.403	0.365	-0.136	0.227	-0.131	1	0.404
X^{16}	-0.062	0.053	-0.053	0.267	0.404	0.14	-0.053	0.022	0.179	-0.007	0.275	-0.196	0.405	-0.281	0.404	1

Note: *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Note: X^1= Percentages of Breastfeeding within one hour of Birth, X^2= Percentages of Breastfeeding within 24 hour of Birth. X^3=Percentages of Breastfeeding after 24 hour of Birth, X^4=Vitamin 'A' intake at least one dose (12-23 months). X^5=Percentage of children aged 12-23 months Fully Vaccination, X^6=Treatment of Acute respiratory infections (ARI) with in last two weeks (under 3 years). X^7=Percentage of Children suffered from ARI, X^8=Percentage of Children suffered from Diarrhea, X^9=Treatment of Diarrhea within last two weeks (under 3 years), X^{10}=Percentage of Women Aware of ORS, X^{11}= Female Literacy (2011), X^{12}=Percentage of BPL Family, X^{13}=Percentage of SC Population, X^{14}= Female marriage below 18 years. X^{15}=Asha Workers, X^{16}=Anganwadi Workers.

The female marriage below 18 years has significant and negative correlation with all most all determinants of infant wellbeing. The weak but positive link has been identified between BPL families, scheduled caste population and female marriage below eighteen years. The convenience of *Asha* and *Anganwadi* workers has documented assenting association with almost all signs of child fitness except some.

CONCLUSION

As today's children are possessions of tomorrow and the way of potential development will certainly led by them. Inherently, child health itself is associated with a number of social and cultural factors. The study demonstrates that poor health status of children is a challenging issue for the state. There is a wide regional heterogeneity in every health indicators of children which are espoused in present study and conceivably this variation may be the consequence of inequity in socio-economic development the state. The information shows a little exposure towards the initiation of breastfeeding practices, vitamin 'A' intake and necessary vaccination course of children in many advanced districts of the state in addition to backward districts like Mewat where the condition is worse. The female literacy and awareness has been found very closely coupled with nearly all child health determinants whereas customary cataloging of household, fiscal position and integer of trained health workers at local level have also considerable impact in child health seminal. So the first and most requisite obsession is that there should be awareness about utilization of health care facilities in initial stage of childhood morbidity at household level because first of all, infant's good or bad health is an outcome of family's consciousness. Secondly, it is exceedingly necessary to confer the key attention towards the health of children in health plans and policy formulation as well as there is also a need to ensure the effectual implementation, surveillance and harmonization of health programmes in addition to providing qualitative environment to improve the health provision of the children in the state.

Conflict of Interest - Nil

Source of Funding- Self by Authors

Ethical Clearance- Nil

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Effectiveness of Structured Exercise Program on Insulin Resistance in Type 2 Diabetes Mellitus – A Pilot Study

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ABSTRACT

Complications resulted due to diabetes are known to be a leading cause of morbidity & mortality among people. While this is a serious issue, it can be delayed and prevented by following a healthy diet and physical activity schedule along with prescribed medication. In the study conducted, a total of 12 T2DM male participants in the age group of 30 - 65 years included. The criteria of exclusion for the participants were those with T1DM, Respiratory disease, Neurological disorders, musculoskeletal problems. The average age of participants in the control group was 59.0±8.6 & 47.25±3.20 in the study group. The participants underwent a structured exercise program. The study showed a significant improvement in their fasting blood sugar ($P<0.01$) when compared to the control group & also there was also statistical difference seen in fasting insulin level ($P<0.03$) from pre-intervention to post-intervention.

Keywords: *Insulin resistance; Aerobic exercise; Resistance training; Glycosylated HB, Homa-IR; Metabolic syndrome.*

INTRODUCTION

Type 2 diabetes is considered one of the fastest growing noncommunicable diseases worldwide which is characterized by, hyperglycemia resulting from defective insulin secretion, insulin action or both. Diabetes complications are the leading causes of morbidity and mortality which can be prevented by taking prescribed medication accurately along with maintaining a healthy diet and physical activity. With this, the long-term complications can delay.(1)

There has been an increase in the cases of type 2 diabetes across the globe. The number of people with diabetes in 2011 was 366 million, which is projected to increase approximately 552 million by 2030.(2)

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In type 2 diabetes there will be elevated glucose levels in circulating blood, caused by impairment in glucose tolerance which leads to the development of insulin resistance. It impairs the ability of muscle cells which are responsible for storage of glucose and triglycerides. Impaired glucose control and insulin resistance reported being a risk factor for the development of cardiovascular disease.(3)

Insulin resistance (IR) commonly associated with glucose intolerance, hypertension, dyslipidemia, endothelial dysfunction and visceral adiposity contributes a significant pathophysiological role in type 2 diabetes.(4)

Insulin resistance and β-cell function are the most frequently evaluated by using the measures like Fasting Insulin and Homeostatic Model Assessment-Insulin Resistance (HOMA-IR). The gold standard tool for evaluation of insulin sensitivity is done by glucose clamp test .(5), (6) Hyperglycemia is an early manifestation of development of diabetes which damages muscle and results in strength and mass loss leading to excess

physical disability in older adults especially in the lower extremity mobility tasks .(7)

Exercise and physical activity considered as a cornerstone for the treatment and prevention of diabetes. [8] Exercise training is an important nonpharmacological tool in the treatment of diabetes.[9],[10]

Aerobic and resistance exercise training improves the glycemic control by increasing insulin sensitivity and together shows a positive impact to improve glucose regulation and also helps to provide the synergistic effect.[10] Resistance training has shown more significant benefits in older patients with impaired glucose levels.[11]

Previous studies have reported that exercise intervention with eight weeks program achieved a beneficial impact on type 2 diabetes mellitus with increased cardiovascular fitness and reduced BMI.[8] In an earlier study, the type and duration of exercise had more significant effect on the results. On the other hand, in most of the studies, the impact of use on insulin resistance hasn't been assessed enough. So, the current research is aimed at evaluating the effects of a structured exercise program on insulin resistance in type 2 diabetes mellitus.

MATERIALS AND METHOD

The study approved by the scientific committee and Institutional ethical committee of Manipal University, Karnataka, India. The study included 12 male participants aged between 30 - 65 years who have type 2 diabetes mellitus and are on oral hypoglycemic agents with or without Insulin therapy. Exclusion criteria for the study included participants with type 1 diabetes mellitus, known case of respiratory disease, coronary artery disease, neurological disorders, pregnant, people with thyroid disorders and musculoskeletal problems that would interfere with the exercise training and unwilling subjects. Informed consent had been obtained after proper explanation of study objective to all the participants and divided into two groups; (1) study group (2) control group. Each group contained six participants who were recruited under purposive sampling and allocated by block randomization method.

All participants were screened for insulin resistance and clinically, biochemically evaluated for fasting blood sugar and fasting insulin level. After screening, participants were randomly assigned into two groups that are study group and control group. The control group consisted of six participants who were not given any structured exercise program, and standard hospital care provided as per physician's advice. The study group included 6 participants who had type 2 diabetes mellitus and were given a set of structured exercise program along with standard care. It mainly consisted of aerobic and resistance exercise like-brisk walking for 45 mins, jogging, weights for upper and lower body major muscle groups. The baseline data collected before the intervention and progression of exercise program done was after six weeks. At the 3rd month, all the participants were reassessed for fasting insulin level and fasting blood sugar in both groups.

DATA ANALYSIS

SPSS version 16.0 software was used for statistical analysis. Repeated measure ANOVA will be used to compare the mean of all the outcome measures. Descriptive statistics are used to analyze the age.

RESULTS & DISCUSSION

Demographic and clinical data of study & control group shown in table 1 & 2**.** The current study aimed to find out the effectiveness of aerobic and resistance exercise program on insulin resistance, which demonstrated that the exercise program proved to be very effective. The study consisted of 12 participants comparable in age, gender and BMI in between both study and control groups. The average age of the participants in the control group was 59.0±8.6 and 47.25±3.20 in the study group. All the participants had a history of type 2 diabetes mellitus with a mean duration of 6.38±3.24. Regular exercise is an important nonpharmacological tool. We designed and administered a structured exercise program for 12 weeks to participants with type 2 diabetes mellitus and evaluated its effects. In this study, the structured exercise program consists of aerobic and resistance exercises which are given to the study group participants.

In the current study, the participants who underwent structured exercise program had shown a mean decrease in fasting blood sugar and fasting insulin when compared with the control group from pre-intervention to post-intervention. It is well documented that exercise training decreases insulin resistance. The AHA, ADA, and ACSM recommend combined aerobic and resistance training for people with type 2 diabetes mellitus.[12]

There are several possible reasons proposed for improved glucose control following "prolonged exposure to exercise, includes structural and biochemical adaptations of skeletal muscles. The former includes an upregulation of mitochondrial proteins involved in respiration -citrate synthase, increased glycogen synthase activity and GLUT4 protein content." The latter comprise resistance training-induced increase in contractile protein content i.e hypertrophy leading to a higher metabolic rate and in turn a potentially higher absolute glucose intake."

Aerobic exercise increases the distribution of substrates through increased proteins of mitochondria and improved muscle fiber capillary. Finally, visceral and intramuscular fat stores, i.e., regional adiposity, is directly proportional to the insulin insensitivity via a direct influence on insulin receptor function in muscle tissue by intramyocellular fat storage.. The said decline may be due to increasing in muscle mass as a result of resistance training, which in turn could contribute to blood glucose uptake without causing alterations in the intrinsic capacity of the muscle to respond to insulin. On the other hand, aerobic exercises enhance the insulin absorption through a higher action, independent of the changes in the muscle mass or aerobic capacity. A combination of aerobic and resistance exercise training may, therefore, be more effective in improving blood glucose control.[12]

Earlier studies results had shown that participation in regular exercise by people with type 2 diabetes improve blood glucose control, reduce diabetes complications and have favorable effects on cardiovascular events, mortality, and quality of life.

Table 1: Mean demographic data in study & control group

Groups (n=6)	Weight (kg) (Mean±Sd)		Height (cm) (Mean±Sd)		BMI (Mean±Sd)		Fasting blood sugar (mg/dl) (Mean±Sd)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Study	73.32±10.39	71.97±9.88	172.25±8.34	172.25±8.34	25.06±3.8	24.65±3.65	168.75±8.34	151.5±4.04
Control	7.035±4.16	69.8±3.82	168.9±6.51	168.9±6.51	24.67±0.89	24.5±0.85	100±7.7	96.75±4.1
P value (p≤0.05)	.614	.696	.559	.559	.846	.963	0.00	0.00

Table 2: Pre –post mean change in fasting insulin resistance:

Variable	Pre intervention	Post intervention	P value (p≤0.05)
Fasting Insulin(µU/ml)	**20.68±5.83**	**16.63±8.26**	**0.03**

CONCLUSION

Based on the results found in our study, participants with increased insulin resistance who underwent structured exercise program had significant improvement in values of fasting blood sugar and fasting insulin when compared with the control group, and these structured exercise program can be recommended to reduce insulin resistance in type 2 diabetes mellitus.

Conflict of Interest- NIL

Source of Funding: Self-funding

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Postural Pain in Computer Users: Role of Preventive and Curative Physiotherapy

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ABSTRACT

Statement of the problem : Working on computers is a major part of most of the jobs now a days and is associated with musculoskeletal discomforts. Sitting in front of laptops, desktops has caused not only the weakening of the muscles and decrease in flexibility but also a bad posture. Intensive computer usage has been associated with work related musculoskeletal disorders among the office or company workers worldwide and the symptoms of these disorders are growing day by day effecting the posture of the individual.

Methodology : A convenient sample of 30 academic professionals suffering from idiopathic postural pain and discomfort constituted the study sample. The subjects were in the age range of 20 – 35 years with mean BMI range (19 to 25). The minimum hours spent daily while working on computer was 4 hours. Pre-and post VAS was used to document the decrease in pain and the RAND 36 questionnaire to assess he quality of life.

Result : Data was analyzed using SPSS. Paired t-test was applied for the pre-and post-exercise scores. Patients suffering from postural pain were found to have low scores in all the eight dimensions assessing the quality of life. Following the exercise regime there has been improvement in the parameters assessed

Conclusion: The present study emphasizes the role of exercises in decreasing the discomfort and to plan the management of these musculoskeletal system disorders. Ergonomics is highly advised in these working set ups to decreases the risk factors and to prevent faulty posture.

Keywords: *Postural pain, RAND -36, Ergonomics, Exercise regimes for postural pain.*

INTRODUCTION

Working on computers is a major part of most of the jobs now a days and is associated with musculoskeletal discomforts. Sitting in front of laptops, desktops has caused not only the weakening of the muscles and decrease in flexibility but also a bad posture.[1] The term ergonomics is derived from Greek word, 'ergon 'which means work and 'nomos' which means natural law is the scientific study which tells or describe about people and their daily work. Intensive computer usage has been associated with work related musculoskeletal disorders among the office or company workers worldwide and the symptoms of these disorders are growing day by day effecting the posture of the individual.[2] These musculoskeletal disorders are considered as an important source of occupational morbidity. They are being associated with high costs to employers such as lost productivity and increase health care, disability, worker's compensation costs. Musculoskeletal disorders cases are more severe than the any illness in the body or nonfatal injury.[3]

Postural back pain has become a major health and occupational hazard especially in employees using computers for long hours and is causing modern day occupational diseases. This has resulted in decreased ability of the employee to perform at the work station but also effected their day to day activities.[4] The effected posture together with physical burden also has both

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biological & psychological components associated with it. Approximately 9-12% population of the world suffers from postural low back pain in their life.[5] It has been recommended that use of well-designed chairs which provide the body alignment for extended periods can help to avoid undue pressure on bony structures and hence avoiding postural discomfort. The poor posture acquired by the people can be attributed to the long sitting hours on computers causing biomechanical changes in spine. Also reduced activity levels together with decreased muscle endurance are among the few factors associated with postural pain.[6,7] If unnoticed or untreated for long , it can result in disability leading to decrease in productivity and effecting one's career.[8] The available literature recommend the following of exercise regime to prevent these postural discomforts which include both range of motion exercises together with strengthening exercises.[9,10] Active treatment protocols has been advocated for the management of nonspecific postural pain in order to improve the strength of the muscles involved by increasing the neural activation of these muscles.[11,12]

METHODOLOGY

A convenient sample of 30 academic professionals working in different fields suffering from idiopathic postural pain and discomfort constituted the study sample. The subjects were in the age range of 20 – 35 years with mean BMI range (19 to 25). The minimum hours spent daily while working on computer was 4 hours. The patients with nerve root compression, prolapsed or disc herniation, severe scoliosis and with recent history of any spinal surgery were excluded. All the included subjects were well explained about the purpose of the study and an informed consent was obtained. The Standard Nordic questionnaire was then administered to assess the musculoskeletal disorders. The most prevalent areas for pain and discomfort included the neck and the low back for majority of the sample. The subjects were then prescribed an exercise program starting with 10 minutes of warm up which included simple stretching exercises followed by range of motion exercises for the neck and low back. These exercises included neck flexion extension exercise with lateral bending and side rotations together with trunk flexion, extension, lateral bending and rotation exercises. Following this strengthening exercises for the same muscle groups were actively performed by the subjects. The entire exercise session was conducted for the duration of 45 minutes four days in a week for a total of four weeks. After the exercise session postural advice was given to the subjects to avoid unnecessary strain on the muscles while working at home settings. Pre-and post VAS was used to document the decrease in pain and the RAND 36 questionnaire to assess he quality of life.

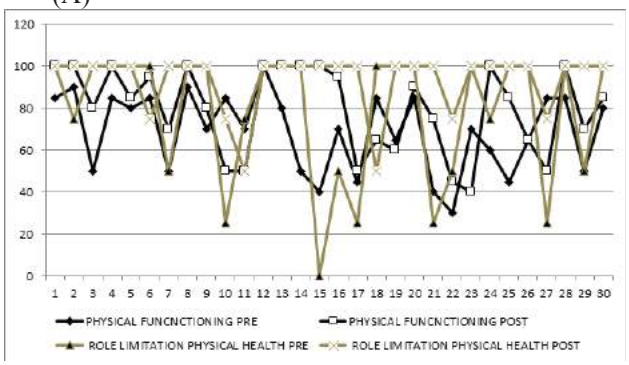
RESULT

Table 1: Data was analyzed using SPSS. Paired t-test was applied for the pre-and post-exercise scores.

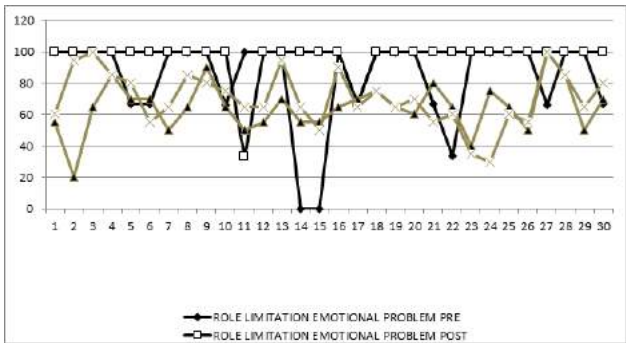
Dimension of RAND	Mean	Standard deviation	P value
Physical functioning	11.5	535.07	p<0.05
Role limitation due to physical activity	15.63	1096.43	p<0.05
Role limitation due to emotional problem	13.37	1046.66	p<0.05
Energy / fatigue	5.84	115.44	p<0.05
Emotional well being	12.96	634.78	p<0.05
Social functioning	12.88	657.86	p<0.05
Pain	16.89	606.87	p<0.05
General health	7.20	200.42	p<0.05

Figure 1: RAND 36

(A)



(B)



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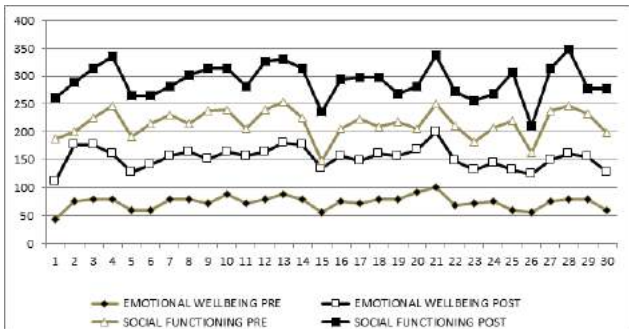

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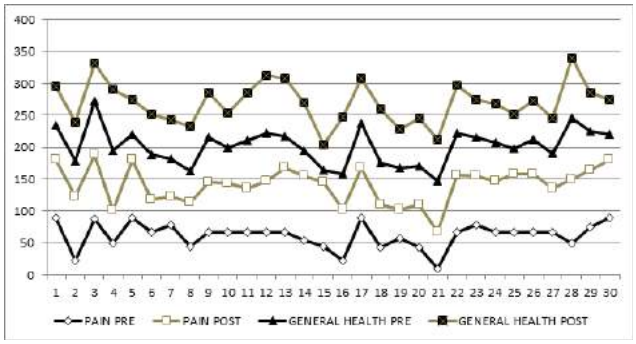

DISCUSSION

The exercise regime prescribed to the clients was found to be effective in decreasing the pain and discomfort of the patient and increasing their physical functioning. This is in accordance with the current literature which also emphasize the beneficial effects of exercises and postural advice for decreasing the musculoskeletal disorders in computer workers.[9] Postural advice provided to the subjects on the first day of the therapy helped to prevent faulty postures during work and adaptation of modified postures.[10] Exercises has helped to increase the overall flexibility of the subject. Stretching exercises helped in relieving the tightness in the muscles due to long sitting hours.

The concept of health-related quality of life and its determinants have evolved since the 1980s in order to deal with those aspects of overall quality of life that affect health either physical or mental.[13,14,15] The RAND-36 is one of the most widely used health-related quality of life survey instrument. The reliability and validity of the RAND 36-Item Health Survey has been well established.[16] It is comprised of 36 items that assess eight health concepts: physical functioning, role limitations caused by physical health problems, role limitations caused by emotional problems, social functioning, emotional well-being, energy/fatigue, pain, and general health perceptions.[17]

Patients suffering from postural pain were found to have low scores in all the eight dimensions assessing the quality of life. Following the exercise regime there has been improvement in the parameters assessed.[18] Along with the postural pain the associated pain in other areas like neck and shoulder also aggravate the symptoms. Slumped sitting during long hours of working has been documented to be one of the major cause of postural pain. Providing adequate modifications and adjustment of height of chair used to work, the pain seemed to be relaxed amongst the subjects. Incorrect arm, wrist and back support and position of keyboard increases the chances of pain and discomfort for the worker.[19] Constant bending of neck and forward sitting without taking support from backrest causes increased tension in muscles of back and neck. This is known to further increase the postural abnormalities together with pain and spasms in neck and back muscles.

A multidisciplinary treatment approach is required for the management of musculoskeletal disorders.[8] A combined exercise protocol which include both strengthening and stretching exercises together with resistance training helps to decrease the pain and discomfort of the patient and increase their quality of

life.[20] The present study emphasizes the role of exercises in decreasing the discomfort and to plan the management of these musculoskeletal system disorders. Ergonomics is highly advised in these working set ups to decreases the risk factors and to prevent faulty posture. [21] A good ergonomics setup not only maximum capacity of workers but also increase their productivity and job satisfaction.

Source of Funding: Self

Conflict of Interest: Nil

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Management of Patient with Pneumonia and Hypothyroidism – A Case Study

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ABSTRACT

Infection risk associated with hyperthyroidism although not uncommon, may present with increased mortality if left untreated. The role of hyperthyroidism and its risk for infection is primarily due to the hyper metabolic effect on the body. Modification to the sympathetic nervous system produces a down regulation of the neutrophil response towards the sites of inflammation and/or infection. Consequently, remarkably increasing the risk for complications of infections to occur i.e., bacterial pneumonia[1]. The 68 year-old female came with the complaints of orthopnea, mild cough and breathlessness. She was admitted to the ICU and was treated with stat doses of anti-hypertensive, nebulization with bronchodilators, physiotherapy and antibiotics. She was also prescribed with Thyronorm to treat hyperthyroidism. This case was effectively managed for two weeks. The patient showed marked progress in the health status after 4 days of rigorous treatment. During the last week of care orthopnea reduced to a great extent as she could sit in fowler's position comfortably. There was marked decrease in the pallor and her general health improved a lot.

Keywords: *(Hypothyroidism, Pneumonia, Infection,*

INTRODUCTION

Pneumonia is found among people with Hypothyroidism, especially for people who are female, 60+ old, take medication Synthroid and have high blood pressure. Hypothyroidism is reported in

Females – 75.32% and males 24.68%. According to FDA reports, the trend of Pneumonia cases was the least in 2004(8), which drastically increased to 198 in 2012. After an active management strategy, the counts fell from 225 in 2016 to 47 in 2017. People with age 60+ the incidence of Pneumonia is 68.96%. Most of the patients with Pneumonia have top co-existing conditions like High BP – 38.69, high blood cholesterol – 20.22%, Depression – 17.13%. Symptoms commonly seen are: dyspnea, fatigue, weakness and cough. Commonly used drugs are: Synthroid, Levothyroxine sodium[2].

Hyperthyroidism generally presents as a well-recognized constellation of symptoms, including nervousness, fatigue, and palpitation, weight loss despite good appetite, loose bowels, heat intolerance, tremor and excessive perspiration. Sometimes, however, the involvement of one organ system can so dominate the clinical picture that initially the diagnosis of hyperthyroidism is missed. Such oligo symptomatic disease occurs especially in older patients who may have only cardiac symptoms. The initial evaluation of these patients yields few clues to the underlying condition. These patients often slip into a fatal thyroid storm that is equally apathetic and hard to detect. We report an unusual case of apathetic hyperthyroidism presenting as recurrent pneumonia[3].

CASE PRESENTATION

The 68 year-old female came with the complaints of orthopnea, mild cough and breathlessness since 3-4 days. She also complained of poor appetite. She displayed general fatigability. She is a known case of Hypothyroidism and hypertension. She has a strong past surgical history. She was operated twice, once for Uterine prolapse repair 15 days back in the year 2017 and Laminectomy in the year 2004. The old lady was examined thoroughly. Although signs of ageing were evident, she presented with Crepitation and Rhonchi on auscultation of both Lungs. Her O2 saturation was 78% and BP was recorded high i.e. 180/90 mmHg.

CHEST X-RAY REPORTS

The reports revealed Tracheal shift and haziness in the Rt. Lung. 2D Echo portrayed LVDD with degenerative Valve changes, LVEF – 60%. ECG recorded Right Bundle Branch Block (RBBB) with sinus rhythm.

Table 1 : Biochemistry tests results

Test	Pt. values	Normal Values	Inference
Hemoglobin	10.9	13-17 g/dL (men), 12-15 g/dL (women)	Decreased
TLC	7980	4,000 to 11,000	Normal
Platelet count	378000	150,000 to 450,000 platelets microliter of blood	Normal
Uric acid	18.28	0.18-0.48 mmol/L	Increased
Creatinine	0.8	0.8-1.3 mg/dL	Normal
Potassium	3.9	3.5-5 mmol/L	Normal
Sodium	118.7	135-145 mmol/L	Decreased
Magnesium	1.47	1.5-2 mEq/L	Decreased
Chlorides	84.7	95-105 mmol/L	Normal
Phosphorus	3.67	1-1.5 mmol/L	Increased
Blood sugar level	144	65-110 mg/dL	Increased
NT Pro-BNP	567.5	⩽ 300 pg/mL	Increased

There is a substantial increase in the Pro-BNP levels of the patient which is suggestive of co-existing hyperthyroidism. Other potential causes of elevated BNP levels include diastolic dysfunction, acute coronary syndromes (very sensitive but not specific), hypertension with LVH, Valvular heart disease, atrial fibrillation, and pulmonary embolism, pulmonary hypertension, sepsis, or COPD[4].

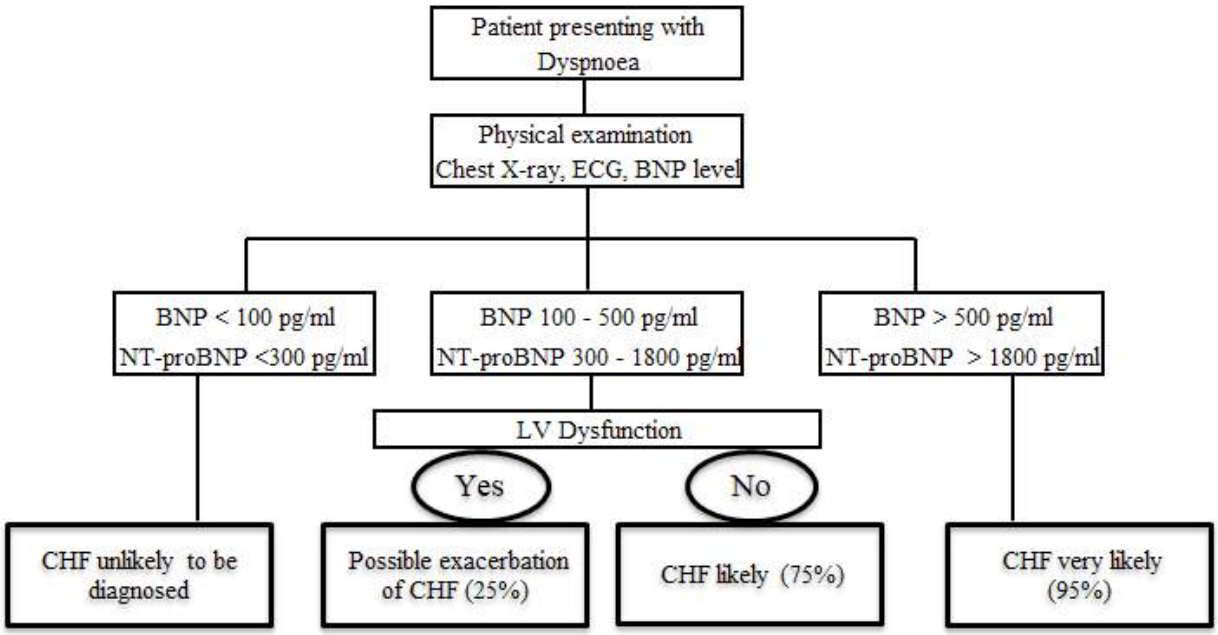

Fig 1: Schematic algorithm of treatment

Clinical presentation of both Lungs

Table 02 – Clinical presentation of Right & Left Lung

Aspects	Rt Lung	Lt Lung
Breath Sounds	-	-
Vocal resonance	-	-
Percussion note	+	-
Crepitation	+	+
Ronchi	+	+

Management and Outcome

Immediately on admission to the ICU, patient was put on Oxygen 2 L/min and was given stat doses of Tab Stamlo 5mg, $MgSO_4$ – 2gm in 100ml NS and Inj. Effcorlin 100 mg, Inj. Lasix 20mg and nebulization with Duoline and Budacort combined drugs diluted in sterile water. Chest physiotherapy was given in order to clear the secretions. The medications prescribed for her were; Tab Natrise 15mg OD along with salt capsules TID, Inj. Pan 40mg OD, Inj. Magnex Forte 1.5gm BD, Tb Azee 500mg OD, Tab Thyronorm 50mcg OD and Tab Stamlo 5mg OD. Nebulization was continued BD and chest physiotherapy was also given.

The patient showed marked progress in the health status after 4 days of rigorous treatment. During the last week of care orthopnea reduced to a great extent as she could sit in fowler's position comfortably. There was marked decrease in the pallor and her general health improved a lot.

DISCUSSION

Pneumonia is a disease commonly encountered along with hypothyroidism. This condition worsens if proper care is not taken well in advance. Similar case is reported with a 75-year-old male ex-smoker with a Brinkman index (BI), which is defined as numbers of cigarette smoked per day times smoking years, of 150 developed a non-productive cough and dyspnea for one year. He had a clinical history of hypothyroidism and received the hormone replacement therapy. He was diagnosed as Pneumonia and was on prednisolone due to the progression of respiratory symptoms. The patient started to receive long term oxygen therapy two years after the biopsy due to slow progression of the disease. A chest radiograph showed fine reticular opacities in bilateral lower lung zones. Chest computed tomography (CT) demonstrated reticular and ground-glass opacities with traction bronchiectasis predominantly in lower lung zones. Radiological diagnosis was possible Usual Interstitial Pneumonia (UIP) pattern[5].

Another 72-year-old male ex-smoker had hypothyroidism and received the hormone replacement therapy developed a cough and was pointed out to have crackles on auscultation. He had cheek erythema and appeared pedal edema for two years. His blood test was positive for anti SS-A antibody, however, there was no symptom suggestive for Sjögren's syndrome. His serum test was also positive for IgG antibodies against bird serum antigens. A chest radiograph depicted faint ground-glass shadow in bilateral lung fields[5].

Ethical approval: Written informed consent was obtained from the patient and hospital author for publication of this case report and accompanying images.

Conflict of Interest: There is no conflict of interest.

Source of Funding: Self

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Prevalence of Chronic Obstructive Pulmonary Disease (COPD) and Risk Factors in Non-Smokers at a Tertiary Care Teaching Hospital of Eastern India

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ABSTRACT

Background: Chronic obstructive pulmonary disease (COPD) primarily affect the lungs and are major causes of morbidity and mortality worldwide. The most widely recognized risk factor for COPD is smoking, but non-smoking factors include biomass fuel, occupational exposure to dusts and gases were studied.

Method: A prospective study was conducted on patients attending pulmonary medicine OPD and IPD in IMS AND SUM Hospital ,Bhubaneswar .Diagnosis of COPD was made by history, clinical examination, spirometric criteria and other investigations as per GOLD guidelines . Risk factors of COPD among non smoker COPD patients were identified by intensive questioning through preformed questionnaires.

Results: In this study 7 groups, 60 patients individual are participated in each group to know the prevalence of COPD and it was revealed that House wife (History of Biomass exposure) and teachers are most susceptible to COPD. In BMI study, it was revealed that 7 patients were under weight. On chest X-ray PA view revealed that Hyperinflation was 47.17%, Flatting of hemidiaphrgam 33.96% and Tubular heart was 18.87%. The prevalence of nonsmoker COPD was more in history of biomass fuel exposures 54.71% (more in female housewife and daily labors).

Conclusions: Biomass fuel exposure in house wife females and teachers exposures to chalk dust are very much prone to COPD.

Keywords: *Biomass, Chalk dust, COPD, Prevalence and non-smokers*

INTRODUCTION

Worldwide, Chronic Obstructive Pulmonary Disease (COPD) is the third leading cause of death and it is more risk to tuberculosis [1]. COPD is characterized by persistent airflow limitation that is typically progressive and associated with an enhanced chronic inflammatory response in the airways and lung tissue to harmful particles or gases [2]. The chronic airflow limitation in COPD is caused by the combination of parenchymal destruction (emphysema) and small airways disease (obstructive bronchiolitis), of which the relative presence varies from person to person [2] . According to estimates from the Global Burden of Disease Study, COPD was prevalent in more than 300 million people in 2013 [3]. The disease burden and its financial impact is predicted to increase, mainly due to population aging [4–6] . Several studies reported on the prevalence of COPD. In European adult populations over 40 years, the prevalence of COPD ranges between 15–20 % and is higher in men than in women [7–9] . Even though the prevalence of COPD is well known, only few studies examined its incidence rate in

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a prospective and standardized manner (supplementary Table 1S in the Online Resource provides an overview of studies which investigated the incidence of COPD). While tobacco smoking is a major risk factor for COPD, only approximately 20 % of smokers develop the disease. More evidence is rising to suggest that other risk factors such as air pollution, respiratory infections, poor nutritional status, chronic asthma, impaired lung growth, poor socio-economic status and genetic factors are also important for disease development [10–12]. About 15–20 % of COPD cases are due to occupational exposures to pollutants at the workplace [9], and about 50 % of subjects who died from COPD in developing countries have been exposed to biomass smoke during lifetime [10]. These facts emphasize the need for action in order to reduce the impact of those risk factors on disease development. To this end, investigating the incidence of COPD is important, since it might shed light on new trends in the development and course of the disease, which in turn can lead to new insights and guidance for prevention and treatment. Till date our focus has mainly been on smoking as a causative factor for COPD. With the emergence of other factors which can cause COPD, there is need for evaluation of these factors. With this background, we undertook this study to identify different non smoking risk factors of COPD which will help in diagnosis, treatment and prevention of such COPD cases.

MATERIAL AND METHOD

This prospective study was carried out with patients attending pulmonary medicine OPD and IPD in IMS AND SUM Hospital, Bhubaneswar. COPD Diagnosed patients were documented by questionably, such as; history, clinical examination, spirometric criteria and other investigations as per GOLD guidelines. Risk factors of COPD among non smoker COPD patients were identified by intensive questioning through preformed questionnaires. Inclusion criteria are included, Patients who are diagnosed with COPD in OPD and IPD, Age 30-90 years, Both male and females , Non -smoker COPD . Similarly, Exclusion criteria are Patients who are sputum smear positive for TB, Pregnant women and HIV , HBV and HCV, Age<30 years or>90 years. All the data regarding occupation of the patients, BMI, radiological evident and history of biomass were documented. All the data were analyzed with SPSS 20 softwares.

RESULTS

In this study 7 groups such as; House wife , Teacher, Ciivile engineer, Masonry, Grocery shope, Farmer and others, 60 patients individual are participated in each group to know the prevalence of COPD (Table 1) and it was revealed house wives with history of biomass exposures and teachers are more prone to COPD. In BMI study, it was revealed that 7 patients were under weight. Whereas 25 patients were obese, which are prone to COPD (Table 2). On chest X-ray PA view revealed that Hyperinflation was 47.17%, Flatting of hemidiaphrgam 33.96% and Tubular heart was 18.87%. Increased bronchovascular marking were also observed (Fig 1, Table 3).

Among the 53 COPD patients 29 were biomass fuel exposed and 24 were not exposure. The prevalence of nonsmoker COPD was more in history of biomass fuel exposures 54.71% (more in female housewife and daily labors) (Table 4).

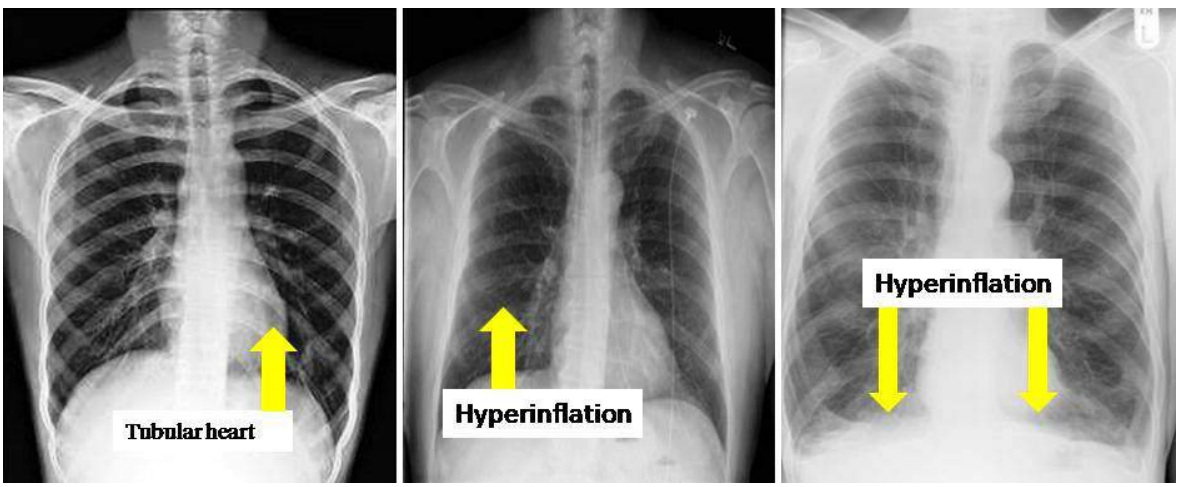

Fig 1 Chest X-ray of Non smoker COPD patients

Table 1: Prevalence of COPD in non smokers

Test population	Total	M	F	%
House wife (N=60)	15	0	15	25.00
Teacher (N=60)	15	11	4	25.00
Ciivile engineer(N=60)	6	6	0	10.00
Masonry (N=60)	5	2	3	8.33
Grocery shope(N=60)	3	3	0	5.00
Farmer (N=60)	8	5	3	13.33
Other(N=60)	1	1	0	1.67
Total (N=420)	53	28	25	12.61

Table 2: Body mass index (BMI) of the study population

BMI		M	F	Total
<18.5	under weight	2	5	7
18.5-24.9	normal	10	2	12
25-29.9	over weight	6	6	12
30-34.9	obesity I	4	4	8
35-39.9	obesity II	2	5	7
>40	Obesity III	4	3	7
Total		**28**	**25**	**53**

Table 3: Prevalence of Chest X-ray of Non smoker COPD patients

Chest X ray	Total	M	F	%
Hyperinflation	25	9	4	47.17
Flatting of hemidiaphrgam	18	10	6	33.96
Tubular heart	10	9	15	18.87
Total	53	28	25	100.00

Table 4: Prevalence of Biomass exposure in non-smoker COPD patients

Biomass Exposure	Male	Female	Total	%
Yes	7	22	29	54.71
No	21	03	24	42.28
Total	**28**	**25**	**53**	**100**

DISCUSSION

Findings from early studies reported that exposure to toxic gases in the workplace [11] grain dust in farms [12] and dust and fumes in factories [13] was strongly associated with COPD. Results from longitudinal studies have associated COPD with occupational exposures in coal miners, hard-rock miners, tunnel workers, and concrete manufacturers. In heavily exposed workers, the effect of dust exposure might be greater than that of smoking [14]. Persistent exposure to silica in construction, brick manufacturing, gold mining, and iron and steel foundries is strongly associated with COPD; average respirable dust concentration is 10000 µg/m3 [15]. The contribution of outdoor air pollution to COPD was investigated in 1958 in UK postmen—the prevalence of COPD was higher in those working in more polluted areas than in those working in areas with less pollution, and the association was independent of smoking [8]. Results of a later study showed reduced lung function in postmen who worked in more polluted cities than in those who worked in less polluted areas [16].These findings have been reinforced by studies in the general population in the UK [17] and USA [18] and in people living close to roads with heavy motor vehicular traffic As most autoimmune diseases occur more frequently in women than men, the autoimmune hypothesis is worth considering as a contributor to the predominance of females among non-smokers with COPD. In this study most of the patients were from rural background in both smoker and non smoker group (58.3% in non smoker vs. 64.8% in smoker). There is no significant difference in geographical distribution among both the groups. More than half of the patients in both smoker and non smoker groups were 40-59 years old (56.3% in non smoker vs.53.1% in smoker).

The proportion of patients in the age group less than 40 years and more than 80 years were found to be more in non smoker COPD as compared to smoker COPD. Proportion of females was found to be more in non smoker COPD and that of male was found to be more in smoker COPD among all age group except age group less than 40 years in which proportion of male were more in non smoker COPD group. In this study we found age is the statistically significant risk factor for COPD, similar results were also found by Behrendt et al. 2005 in USA[19]. In our study, sex is also found statistically significant risk factor for COPD, we found that non-smoker COPD were higher in female patients, but it might be due to factors like exposure to biomass smoke, which is itself a major non-smoking risk factor for COPD, was more common in female. Female sex as a risk factor for COPD in non-smoker group was also found by Ten et al. 2003 in 12 countries of Asia pacific [20] . Exposure to biomass smoke as a risk factor has been found to cause COPD in nonsmoker group in this study and the association of this factor is statistically significant with nonsmoker COPD. Similar association has also been found by Lindstrom et al. 2001 in Finland and Sweden [21]. There is evidence that substantial proportion of COPD, up to 20% can be attributed to occupational exposure [22]. Occupational exposure as a risk factor among non-smoker COPD were also found by Lampracht et al. 2008 in Austria [23] and Ehrlich et al. 2008 in South Africa [24]. Genetic susceptibility has attracted general attention [25,26] The difference is because our study is hospital based study and most of the patients were of age >40 years, so it is very difficult to take history of respiratory infection in childhood in the absence of patient's parents. There is evidence that exposure to passive smoke is associated with COPD [25] and affects women more often than men[26].

CONCLUSION

Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality worldwide. Tobacco smoking is established as a major risk factor, but emerging evidence suggests that other risk factors are important, especially in developing countries. An estimated 25–45% of patients with COPD have never smoked; the burden of non-smoking COPD is therefore much higher than previously believed. About 3 billion people, half the worldwide population, are exposed to smoke from biomass fuel compared with 1·01 billion people who smoke tobacco, which suggests that exposure to biomass smoke might be the biggest risk factor for COPD globally. We review the evidence for the association of COPD with exposure to biomass fuel ,teacher ,civil engineer ,masonry, grocery shop and farmers.

Ethical Clearance: This study is approved from our institutional ethics committee.

Source of Funding: Self

Conflict of Interest: Nil

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Assessment of Self-Care Practices among Diabetic Patients, Suraram, Telangana State, India

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ABSTRACT

Background: India contributes to 69.2 million diabetics (8.7%) as per World Health Organization, 2015. Specific, effective and affordable care reduces morbidity and mortality among them. Although challenging, self care is one of the important practices among diabetic patients which is not well-documented. Therefore, assessment of unique data sets on self care practices among diabetics immensely helps to improve their quality of life, prevent complications andpre-mature deaths.

Objective: To assess the self-care practices among diabetic patients residing at Suraram, Telangana State

Study Design: Cross-sectional study

Setting: Urban Health Training Centre

Material and Method: Data was collected from 155 Diabetic patients during July to December 2016, using a semi-structured questionnaire. Summary of Diabetes Self-Care Activities (SDSCA) instrument was employed to collect the data.

Statistics: Reported as frequencies in numbers and percentages. Chi-square and ANOVA were performed by Statistical Package for Social Sciences (SPSS, Inc., Chicago, IL, version 19). $p < 0.05$ was set to consider as significance level.

Results: Study subjects ranged from 25 to 83 yrs of age, mean age 52y± 11.52, females were slightly more 80 (51.6%); Most were Hindus 123 (79.4%); Maximum Backward class (BC) 73 (47.1%); 84 (54.2%) belonged to Upper and Lower middle class of Kuppuswamy's socio-economic class; 90 (58.1%) smoked and 93 (60%) addicted to alcohol. Overall poor practices were in 82 (53%) of them. There was an association between self-care practices and socio-economic class, smoking, alcohol, co-morbidities and complications ($p < 0.05$). However, age, sex, religion, caste, type of family, marital status, duration of disease did not show any association.

Conclusion: Promoting self-care practices is vital and has to be emphasized by the clinicians who treat them

Keywords: *Diabetes, Self-care practices, Co-morbidities*

INTRODUCTION

Diabetes Mellitus (DM) a common chronic metabolic disorders of multiple aetiologies, a fourth leading cause of death contributing to 9% mortality in humans across the globe[1].According to International Diabetic Federation (IDF)[2], approximately 415M adults have diabetes which could reach 642 M by 2040. Of

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these 80% of themare from developing or less developed countries (middle and low- income countries). India contributes nearly 69.2M diabetics (8.7%) which is an alarming trend[3]. Over the past two decades, a dramatic increase in the global prevalence of DM was observed. Although both type 1 and type 2 DM are on the rise, a more rapid increase in the prevalence of type 2 DM is observed[4]. It is usually associated with certain complications such as neuropathy, retinopathy and nephropathy. In addition, reduced blood flow and nerve damage in the feet leads to Diabetic Foot. In addition to morbidity, acute infections may lead to amputation and mortality in severe cases which involve huge health care costs[5] As the incidence of DM increases across the globe[2] consumes a major chunk of health care resources, WHO called for proactive diabetes management by accelerating prevention and treatment of the disease. Diabetes management regime requires multiple strategies including self-care to regulate hyperglycaemia and treat its associated complications. Self-care practices (SCPs) in diabetes depend on the patient's ability to learn and cope up with the complications associated with the disease as a function of time as emphasized by many professional bodies[6]. The SCPs include but not limited to monitoring of blood glucose level, strict control of diet, optimum physical activity, proper foot care and above all compliance to medication[7]**.** Earlier studies demonstrated that patients who are knowledgeable in SCPs exhibitedgood glycemic control and dramatic progress in their diabetic management[8]. On the other hand, there is four times increase complications in patients who were not aware of SCPs[9]. Thus, for achieving effective diabetes management, a set of complex self-care skills are required by the diabetic patients. Research is warranted to assess the SCPs among diabetic patients, which hold the key for reducing their complications and improving the quality of life. A perusal of the available literature indicates that such baseline studies on SCPs in urbanpopulations are scarceinTelangana state. In the light of this, we made an attempt to explore the SCPs among diabetic patients in an urban community of Suraram near Hyderabad city in Telangana state.

MATERIALS AND METHOD

A community based cross-sectional study was conducted to assess SCPs among Diabetic patients in field practice area of Urban Health Training Centre (UHTC), Suraram, Hyderabad city, Telangana state, which is in the southern part of India. This training centre is attached to Department of Community Medicine, Malla Reddy Medical College for Women (MRMCW), Suraram. UHTC covers 7500 houses with a population of 29956, in 16 Municipal wards. The study subjects are patients suffering with type-2 diabetes. A convenient sample size of 155 (75 men and 80 women) was considered and study subjects were selected by simple random technique. Data was collected from July to December 2015. Inclusion criteria: Diabetic patients 18years and above diagnosed by physician with or without co-morbidities or complications.Exclusion criteria were: Patients not willing to participate in the study.Ethical clearance was obtained from the Institutional Human Ethics Committee, MRMCW. An informed written and signed consent for participation in the study was taken from all the participants in English/ Telugu (local vernacular) language.Data were recorded by using a a semi-structured field tested questionnaire. No surrogate responses were permitted. Assessment of Social class of caste was as per Social Welfare Department, Government of Telangana. It was coded as Open category (OC), Backward Class (BC), Scheduled Caste (SC), Scheduled Tribe (ST). Standard Indian classification system was followed to assess occupation and coded as skilled workers, unskilled workers and professionals[10]. Education level was classified under illiterate and literate categories. Data were collected on age, gender, type of family, presence of co-morbidities or complications like heart disease, high blood pressure, tuberculosis, chronic bronchitis, cancer; if they had a stroke and receiving regular medication for this condition; tobacco use in any form (smoked or chewed on a daily basis in the past six months), and regular consumption of alcohol (for ≥10 days a month in the last six months).Self-Care practices were studied in five domains of Physical activity (PA), Dietary Practices, Blood Sugar monitoring, Drugs and foot care. These domains were adapted from American Association of Diabetes Educators (AADE)[10]to measure the outcome. This ensured the validity of study instrument. PA domain was measured as per Indian diabetes risk score[11]. A valid scale of Summary of Diabetes Self-Care Activities was used (SDSCA)[12]for other domains. Scores were assigned to each domain based on response of the study subjects. The operational definition of SCPs was defined as "the extent to which patients do physical exercise, follow diet, medication schedules and monitor blood sugar levels as prescribed by their health care providers for the last 15 days. This short period was chosen to minimize recall

bias. For Dietary practices, questions were whether diet chart was followed, red meat, saturated fats like ghee, sweets, tea with sugar were avoided, vegetables and fruits (> 400 gm)[17] consumed daily in the last one week - a maximum score of 15 was given; information on daily physical activity of the participantsbased on the duration and frequency over the past one month was also collected. Any type of aerobic exercise for minimum of 150 minutes per week was given a maximum score of 9; compliance of Blood sugar monitoring as prescribed by health care provider was given a score of maximum1; Regularity of taking Medicines was given a maximum of 10; Foot care like examining the feet, washing, drying, cleaning, wearing ordinary/microcellular or no footwear at home was given a maximum score of 15. Scores of each domain were added to get a performance score in that domain. Thus by summing up the scores of all the five domains, a maximum overall score of 50 was possible which was an outcome variable. A score of 25 and above was considered good practices and a score below 25 was considered as poor performance. The primary outcome in this present analysis was self-care practices. A test of independence, chi-squared test was performed to observe the relation between various demographic, socioeconomic categories, co-morbidities, complications and self-care practices. ANOVAwas applied to analyze the effects of duration of disease (continuous variable)on self-care practices (independent variable). Statistical-Package for Social Sciences (SPSS Inc, Chicago and III) 19th version was used for statistical analysis. p <0.05 was considered forstatistical significance.

RESULTS

Table-1 illustrates the association between socio-demographic characteristics and self-care practices among study subjects. A total of 155 subjects (75 men and 80 women)participated.Their age ranged from 25 to 83 yrs with a mean age of 52 y ± 11.52. Females were slightly more 80 (51.6%). Most of the participants, 123 (79.4%) belonged to Hindu religion and 110 (70.97%) were from scheduled castes, scheduled tribes and backward class (BC).Majority of the study participants were from nuclear families,132(85.16%). Regarding the marital status, 136 (87.74 %) individuals were married and living with spouse.As per the modified Kuppuswamy,s socio-economic class, most of the participants84 (54.2%) belonged to upper-lower class. Furthermore, 52 (33.55%) of them from lower class exhibited poor self care practices. Ninety(58.1%) subjects were smokers while 93 (60%) addicted to alcohol. Overall poor practices were observed in 82 (53%) of them. There was an association between self-care practices and socio-economic class, smoking and alcohol consumption ($p < 0.05$). However, age, sex, religion, caste, type of family, marital status, duration of disease did not show any association.

Table-2 depicts the association between co-morbidities, complications and self-care practices among the study participants.Ninety three (60.00%) of them had co-morbidities and 111(71.60%) of them had complications associated with diabetes. Poor practices were observed in 62 (33.50%)and 60 (38.70) among them. Pearson chi-square tests found the relation between these characteristics and SCPs which was statistically significant (p<0.05)

Table-3 The mean duration of diabetes among the study population was5.6yrs.Twenty two (14.1%) of themhad diabetes for lessthan 1yr, 36(23.3)between 1to 3yrs,43(27.8%)for 3-5yrs and 54(34.8%) for more than 5yrs.Of these, poor practices were observed in 34 (21.9%) of cases. One way ANOVA test showed no statistically significant difference between groups,F(24,130) = 0.917, p=0.579

Table–1 Association between Socio-Demographic Characteristics and Self-Care Practices

Demographic characteristic		Good Practices No.73 (47%)		Poor Practices No. 82 (53%)		Total n=155 No. (%)		χ^2 value p-value
Age(y)	25-34	05	(3.23)	06	(03.87)	11	(07.10)	0.433 p=0.979
	35-44	12	(7.74)	14	(09.03)	26	(16.77)	
	45-54	24	(15.48)	25	(16.13)	49	(31.61)	
	55-64	22	(14.19)	23	(14.84)	45	(29.03)	
	>=65	10	(6.45)	14	(09.03)	24	(15.48)	
Sex	Male	35	(22.58)	40	(25.81)	75	(48.39)	0.181 p=0.917
	Female	38	(24.52)	42	(27.10)	80	(51.61)	

Cont... **Table–1 Association between Socio-Demographic Characteristics and Self-Care Practices**

Religion	Hindus	61	(39.35)	62	(40.00)	123	(79.35)	1.777 p=0.411
	Muslims	06	(03.87)	12	(07.74)	18	(11.62)	
	Christians	06	(03.87)	08	(05.16)	14	(09.03)	
Caste	Other Caste	23	(14.84)	22	(14.19)	45	(29.03)	0.410 p=0.523
	SC,ST & B.C	50	(32.26)	60	(38.71)	110	(70.97)	
Type of Family	Nuclear	62	(40.00)	70	(45.16)	132	(85.16)	0.005 p=0.939
	Extended	11	(07.10)	12	(07.74)	23	(14.84)	
Marital Status	Single, Widow, Divorce, etc.,	07	(04.52)	12	(07.74)	19	(12.26)	0.914 p=0.339
	Married and living with spouse	66	(42.58)	70	(45.16)	136	(87.74)	
Socio-economic status	Upper Middle (II) Lower Middle (III)	54	(34.84)	30	(19.35)	84	(54.19)	21.746 p=0.001*
	Upper Lower (IV) Lower (V)	19	(12.26)	52	(33.55)	71	(45.81)	
Smoking	Yes	13	(08.39)	77	(49.68)	90	(58.06)	91.837 p=0.001*
	No	60	(38.71)	05	(03.23)	65	(41.94)	
Alcohol	Yes	21	(13.55)	72	(46.45)	93	(60.00)	5.809 p=0.016*
	No	52	(33.55)	10	(06.45)	62	(40.00)	

*Significant at p <0.05

Table–2 Association between Co-morbidities, Complications and Self Care Practices

Characteristics		**Good Practices No.73 (47.1%)**		**Poor Practices No. 82 (52.9%)**		**Total n=155 No. (%)**		**χ^2 value p-value**
Co-morbidities	Yes	31	(26.50)	62	(33.50)	93	(60.00)	17.679 p=0.00003*
	No	42	(20.60)	20	(19.40)	62	(40.00)	
Complications	Yes	51	(32.90)	60	(38.70)	111	(71.60)	16.199 p=0.00006*
	No	22	(14.20)	22	(14.210	44	(28.40)	

*Significant at p <0.05

Table-3 Comparison between Duration of Disease and Self Care Practices

Characteristic		Good Practices No.73 (47.1%)	Poor Practices No. 82 (52.9%)	Total n=155 No. (%)	F- value p-value
Duration of Disease (yrs)	<1	10 (06.4)	12 (07.7)	22 (14.1)	0.917 p=0.579
	1-<3	15 (09.7)	21 (13.6)	36 (23.3)	
	3-<5	28 (18.1)	15 (09.7)	43 (27.8)	
	>5	20 (12.9)	34 (21.9)	54 (34.8)	

*Significant at p <0.05

DISCUSSION

In this study, the participants agesranged from 25 to 83yrs, which is similar to the study conducted by Sekhar TVD Sasi in South India[14].These findings may be because of the longevity of life, accessibility and better health services in urban areas.Maximum of them were between 45 to 54yrs (31.61%), which are slightly higher compared to study conducted by Peraje, where-in the participants agesranged from 40 to 49 years **(Peraje Vasu Dinesh et al).**The mean age is 52 yrs± 11.52almost similar to studies conducted in south India by Sekhar and Kalaiselvi[14,15]. The mean duration of disease is 5.6yrs which is slightly lower when compared to study by Sekhar[14]. On the other hand, age, sex, religion, caste, type of family, marital status, duration of disease did not show any associationwith SCPs,which was similar to study by Wu et al,. However study by Sekhar[14]showed an association age and sex with SCPs, which was statistically significant (p=<0.05). In addition, most of the studies (Bogner et al, few workers. 2007), demonstrated a positive correlation between age and SCPs. It is well known that smoking and alcohol consumption in diabetic patients often leads to various co-morbidities and associated cmplications. Around 52(33.55%) participants from upper lower and lower middle class have shown poor self-care practices which may lead to DM associated morbidities/complications. This is in agreement with the findings of previous studies (Chio et al 2009, Hosler et al. 2005). Apparently, high income helps in facilitating certain self care practices related to the physical activity, dietary practice, blood sugar monitoring, compliance to medication and proper foot care. In the current study, significant correlation ($p<$ 0.05) was seen between SCPs and socio-economic class, smoking and alcohol consumption. Poor SCPs were noticed in patients belonging to low socio-economic class, those addicted to smoking and alcohol, suggesting lack of awareness on proper diabetic management. Comparison between duration of disease and SCPs showed 22 participants (14.1%) had diabetes for less than 1yr, 36 (23.3%) for 1-3yrs, 43 (27.8%) above 3-5yrs and 54 (34.8%) had diabetes for more than 5yrs.Of these, poor practices were observed in 34 (21.9%) of them. However, there was no association between SCPs and duration of diabetes statistically (P>0.05). This could be attributed to the fact that current interventions only focus on patient and use of health services. In contrast, research indicates that long duration of diabetes had a positive correlation with good adherence to self-care practices (Chio et al. 2009; Xu et al.2010)

LIMITATIONS

As this is a pilot study involving a small sample population, the results cannot be generally applicable to the entire community.

CONCLUSION

Management of DM can be improved in the long run by supporting SCPs among the diabetic patients. Health education on SCPsby health care providers will improve clinical outcomes and aid them to lead quality life.Hence role of clinicians in promoting self-care practices among these patients is vital and has to be emphasized.

Conflicts of Interest: No conflicts of interest

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Comparison of Stress Patterns in the Edentulous Mandibular Bone around Four Implant Retained Over Denture and All-On-Four Concept – A Three Dimensional Finite Element Analysis

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ABSTRACT

Purpose: The purpose of this study was to compare the stress patterns on a four implant supported over denture with that of All-On-Four Concept.

Method: The computed tomographic image of the human edentulous mandible was simplified into an arc shaped bone block of 7.5mm thick and 15 mm high with 1mm cortical bone layer. With the help of projector the implant design and dimensions were carefully recorded and same measurements were transferred to the FEA software. Three dimensional finite element analysis models of four implant supported over denture and the model with ALL-On-Four concept were prepared and were exposed to five different loading simulations.

Results: From the study it was found that the stress levels during full mouth loading was the highest for the four implant supported over denture compared to the prosthesis with All-On-Four concept. The stress levels for the cantilever and non-cantilever were nearly the same for all the simulated designs.

Keywords: *Resorbed ridges, implant, All-On-Four, overdenture, finite element analysis.*

INTRODUCTION

In recent years replacement of missing teeth with the implant supported prosthesis has been considered as one of the most sought after and predictable treatment options for the patients. Though more than 95% implant success has been reported, failure of an implant can lead to disappointment for both the clinician as well as the patient.[1,2,3] Hence an attempt to understand the biomechanics and structural properties associated with implant load due to external forces needs to be analysed [3,4]. The force factors during loading, the dynamic nature of loading, mechanical and structural properties of the prosthesis are the factors involved in design of an implant prosthesis[2,6]. However accurate data on such

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parameters are incomplete.

Often the available bone height in the posterior region is less than in the anterior region. Hence the proposed methods in the treatment of posterior edentulous ridge would include bone grafting, sinus floor elevation or zygomatic implants. [5,7,11] These procedures might result in post-surgical complications like donor site morbidity, loss of bone graft and implant, sinusitis and fistula etc.

The All-On-Four concept was introduced to treat completely edentulous ridges without any advanced surgical procedures.[1,2,6] The concept aims to maximise the use of existing bone thereby permitting longer and stronger implant placement. In All-On-Four concept, four implants are placed in the edentulous jaw. Two vertical anterior fixtures in the lateral incisor region and two posterior long fixtures with distal angulations at the premolar regions.[3,4]

Placing the tilted implants is an effective and safe alternative in treatment for patients with atrophic ridges. The main advantage of this method is the possibility of omitting or reducing the length of the cantilever in the prosthesis. The concept permits placement of longer implants thereby increasing the implant- bone interface. Since the implants are placed in the patient's existing bone, complicated surgical procedures can be avoided.[4,7] The present study aimed at comparing the amount and distribution of stress in the mandibular bone surrounding the implants in four implant supported prosthesis with the All-On-Four concept.

Aim

To compare the stress patterns in the edentulous mandibular bone around four implant retained over denture and the prosthesis restored with All-On-Four concept.

Objectives

To compare the biomechanical behaviour of the prosthesis restored with All-On-Four concept with that of four implant retained over denture using finite element analysis.

To compare the Von Misses stresses induced on the implants under different loading simulations.

MATERIAL & METHOD

After obtaining approval from the institutional ethical and research committee, the study was carried out at

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Department of Aeronautical Engineering, Manipal Institute of Technology, Manipal Academy of Higher Education, Manipal, Manipal.

Armamentarium used for the study

CT Scan of edentulous mandible

- Replace Select Tapered TiU NP 3.5 x 13mm (Nobel Biocare)
- The Profile Projector (METZ- 801)
- Cylindrical Retainer of 4mm diameter.
- ANSYS - 11 Workbench Software.

Preparation of FEM model of the Edentulous Mandible. [1,9]

A Computerized tomography image of the human edentulous mandible was obtained and introduced into the Computer Aided Design Software. Using the ANSYS software, the CT image of the mandible was later simplified into an arc shaped bone block with dimensions of 7.5 mm thick and 15mm high. A 1mm cortical bone layer was established overlying the entire mandible whereas trabecular bone was used in the internal structure, simulating the type III bone. Once the computerized 3-Dimensional model was obtained, incorporation of the implant design into the model was planned.

Preparation of the FEM implant model

The study was done to compare the stress patterns in the edentulous mandible under various implant supported overdenture designs, so the accuracy and contour of the threaded implant was a major concern. But the contour, shape and depth of the threads in the implant could not be evaluated and reproduced in the 3-dimensional model with the help of the computerized tomography, hence an instrument called 'Profile Projector Optical System' was used in this study. The values that were obtained from the profile projector were then used to prepare an accurate 3-D model of the threaded implant along with

the retainer.

All profile projectors display magnified images on an appropriate viewing screen, as an aid to more precise determination of dimension, form and occasionally physical characteristics of sample parts. These optical projectors are able to display a two dimensional projection of a part rather than a simple linear dimension as with most other gauging devices.

This instrument creates work piece image on the projection screen at desired magnifications (10x, 20x, 50x) to provide accurate dimensional measurement as well as inspection of the contour and surface condition of the work piece.

The METZ- 801 features a large Projection Screen 300mm diameter and the combination of high performance projection lens and an optical system minimizing the magnification error, which may occur due to insufficient or improper focussing and ensures accurate measurements over the entire projection screen. The accuracy of this instrument is known to be 0.001mm.

Preparation of the working model [1,9]

Three dimensional working models were constructed using 3D computer aided design software (ANSYS). The models represented the mandible restored with 4 implant supported prosthetic design and the design restored with the All On Four Concept. A rigid type III gold prosthetic bar, 6mm thick and 4mm high and in the shape of an arc was then designed and joined to the abutments.[1]

For the 3- Dimensional four implant supported prosthesis model, in addition to the mesial implants placed bilaterally, distal implants were vertically placed bilaterally in the premolar region.

For the 3- dimensional 'All-On-Four' model, two anterior implants were placed vertically in the position of the lateral incisors and two implants were placed bilaterally in the position of second premolars and tilted distally to 30º angle.

To evaluate and compare the distribution of stresses on the implant on the three models, four loading situations were simulated in each model using load values similar to those of functional bite movements from patients with implant supported prostheses.

- Loading 1: Full mouth biting – bilateral and simultaneous vertical static loads of

  - 200 N was applied on the occlusal surface of the first molars (Cantilevers)

  - 150 N on the occlusal surface of second premolars

  - 150 N on the occlusal surface of first premolars

  - 100 N on the distal of canines

- Loading 2: Lateral Load – Unilateral static load of 50 N applied in the region of left canine.

- Loading 3: Cantilever Load – Unilateral vertical static load of 200 N was applied on the left cantilever.

- Loading 4: Load without the cantilever - Unilateral vertical static load of 200 N was applied in the region adjacent to the left second premolar, simulating absence of cantilever.

The results of the mathematical solutions were later converted into visual results and expressed in colour gradients, ranging from shades of red, orange, yellow, green and blue, with red representing highest stress values. The stress values in the three models were collected and compared, with the points of greatest magnitude identified by the Von Mises equivalent stress levels.

This study was carried out on FEM models simulating four implant retained prosthesis and the prosthesis restored with the All-On-Four Concept under a) Full mouth load, b) Lateral load, c) Cantilever load, d) Load without cantilever.

RESULTS

The results of the numerical analysis are shown in Table - 2 for Von Mises stresses occurring for the FEM models.

The graph 1 represents the biomechanical behaviour of the four implant supported overdenture FEM models under different loading simulations. The maximum stress level in this model was found during the full mouth loading simulation which was 303.51 Mpa followed by load simulating cantilever loading which was 187.34 Mpa and load simulating load without cantilever which was 125.09 Mpa. The least stress was found during lateral loading shown as 57.35 Mpa.

Graph 2 illustrates the graphical representation

of the biomechanical behaviour of the FEM model simulating the prosthesis restored with the All-On-Four Concept. The maximum stress in this simulation was found during full mouth loading which was 253.37 Mpa followed by load simulating lateral load which was 88.01 Mpa and load simulating the cantilever load which was 85.22 Mpa. The least stress was found when load without cantilever was simulated which was 60.21 MPa.. The stress levels in the model simulating the All-On-Four conecpt were comparatively much less than the four implant supported overdenture model.

From the graphs it can be inferred that among the two models, the stress levels for full mouth loading simulation was more for four implant supported overdenture design and the least for All-On-Four overdenture design. For both the designs, the least stress was when the implants were loaded in a lateral direction. The stress levels for cantilever and non-cantilevered designs were nearly the same for all the simulated designs. From the study we also found out that maximum stress concentration was near the neck of the implant.

Table – 1: Representing Young's modulus and Poisson's ratio.

Material	Young's Modulus	Poisson's ratio
Cortical Bone	13.7	0.30
Trabecular bone	1.37	0.30
Titanium	115	0.35
Type III gold	100	0.30

Table – 2 : Representing peak stress values under different loading conditions.

	FOUR IMPLANT	ALL-ON-FOUR
A	303.51	253.37
B	57.35	88.01
C	187.34	85.22
D	125.09	60.21

DISCUSSION

Various clinical studies claim a rate of more than 90% success with implants for many implant systems.[5,7] One of the most important deciding factors in success or failure of dental implant is the manner in which the stresses are transferred to the surrounding bone. However the vertical and transverse loads from mastication induce axial forces and bending moments and result in stress gradients in implant as well as the bone. Various factors like type of loading, bone-implant interface, length and diameter of implants, shape and characteristics of the implant surface, the prosthesis type and also the quality and quantity of the surrounding bone decide the load transfer from the implants to the surrounding bone.

Despite medical and technological advancements, resorption of the ridges is one of the most common problems in edentulous ridges. In addition to this various anatomical landmarks and associated surgeries prevent us from placing implants in favourable sites. Hence All-On-Four concept is an excellent alternative to rehabilitation of patients with resorbed ridges.

The finite element analysis is a technique for obtaining a solution to a complex mechanical problems by dividing the problem domain into smaller and simpler domains. Since the components in the dental implant-bone system are extremely complex geometrically, finite element analysis has been considered as the most suitable tool for analysis.

Keeping in mind the consequences of unwanted stresses, this study was an attempt to compare the Von Mises Stresses around the implant by different loading conditions, on two different finite element models. The models were simulated on the basis of implant number, position, angulation and the type of prosthesis which is a Type III gold bar.

The results of the study imply that there is substantial physiological advantage in use of the All-On-Four concept compared to the conventional four implant supported prosthesis for rehabilitation of edentulous patients with implant supported prosthesis. The angled abutments permits placement of the implants in the most favourable quantity and quality of available bone in patients with compromised osseous anatomy, while enhancing the engineering and mechanics of the prosthesis by correcting the spatial relationships.

CONCULSION

The results of this preliminary investigation suggests that endosseous implants placed following the All-On-Four concept for rehabilitation of completely edentulous patients has overall mechanical advantage when compared to the four implant supported prosthesis. And the All-On–Four concept can be routinely used in patients with compromised ridges and close proximity

to important anatomical structures thereby avoiding the requirement for additional surgical procedures.[2,3,7]

Conflict of Interest : Nil

External Funding : Nil

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Enablers of Telemedicine Technology Adoption: A Case-Based Conceptualization in Indian Context

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ABSTRACT

The paper investigates the information processing theory for telemedicine reach and ends up with the proposed model with the constructs which may leads towards the adoption behavior and reach. The systematic literature review followed by one to one interaction with the physicians, patients and telemedicine experts, the anecdotal propositions are made based on case studies which are likely to affect the implementation and adoption of telemedicine technology. The fit between the telemedicine information processing needs and telemedicine capabilities required for the adoption and reach of telemedicine. The fit is required between need and capabilities, so managers have to invest in partnership specific assets, training programs should be there to adoption and reach.

Keywords- *Telemedicine, Healthcare, Rural India, Information Processing needs, Information Processing Capabilities*

INTRODUCTION

Technology has always played an integral role in human social life. While use of some technology has increased standard of living, some other technology has improved the quality and assurance of life. Telemedicine is use of electronic information and communication technology by healthcare professionals with an aim to deliver a better health care services for patients with the different geographic locations. With the development of IT infrastructure, innovative technology applications in the field of healthcare had revolutionized healthcare delivery to patients across the globe.

But in a country like India where large chunk of population lives in rural areas and often remote areas as well, though the promise of telemedicine carries lots of ideology and prospect, but how effective it is actual scenario in reaching to the needs of the poverty-stricken village people in often infrastructure-starved villages, looms large as a big question. This study aims to explore the way how the fit between the telemedicine information processing needs and telemedicine information processing capabilities can generate the adoption of telemedicine and ultimately leads towards the reach of telemedicine technology.

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LITERATURE REVIEW

Telemedicine is a use of telecommunication technologies to provide medical information and healthcare services[1]. It provides a digital platform on which patients' and medical experts or physicians can interact and physician can diagnose as well as prescribe the treatment and/or medicines as per the disease condition of patient[4]. By using the bandwidth, fog computing and the internet-based technologies telemedicine enables a treatment and diagnosis from the remote location as expert can treat the patient who lives in interior rural India and may not have an access to the superior healthcare[15].

Recently Indian healthcare sector is having three major issues to deal with. Quality of care, access to care and affordability to care. Available WHO statistics also supports our argument as WHO (2016) data states that there is only 0.797 physician per 1000 population in India. Hence, provoding healthcare to the last mile is a challenge.

Telemedicine is proven to fasten the speed of healthcare delivery because of its capabilities of remote sensing and remote treatment traveling van be avoided for the healthcare servie[2,3]. With the use of telemedicine network physician can use the collaborative network and can provide the services to more patients in a stipulated time [1]. Moreover, India is devided in to metro, semi metro, town and villages. Where, metro and semi metro cities have good service providers for healthcare in compare to town. But, villages are still untouched area for giant healthcare service providers who can provide extremely good services to open up a facility. Which creates a need for providing healthcare services to the last mile which cannot be fulfilled without the information sharing and information processing as one wrong decision can leads to the fatigue for the patient. Which clearly states that there is an *Information Processing Need.* By exploitation of telemedicine capabilities like Information communication technology for health (ICT4H) [5] the gaps between the service quality can be narrowed.[12]

With the proper fit between the information processing needs which is providing the healthcare services via integrated information systems enabled through information technology and information processing capabilities which is telemedicine capabilities a proper healthcare system can be governed[12]. Hence, it is possible to provide the affordable and quality healthcare services to the last mile as well as a people living below the poverty line[10]. with the industry 4.0 era healthcare services can also be provided from the mobile and wearable devices enabled IoT technology which can lead to the higher patient satisfaction with the better relations with the healthcare service providers also.

RESEARCH METHODOLOGY

The study follows a two-stage methodology for initial model formation and conceptualization. For the conceptualization part, systematic review of relevant academic and practitioner literature has been done followed by in-depth scenario understanding through one-to-one discussions with few key stakeholders like physicians, patients, and technology experts. Systematic literature review has been followed by focused group discussion aiming at understanding the underlying practical linkages and subsequently followed by in depth interviews with semi structured questionnaires. Certain key aspects emerged out of as dominant enablers which hints towards providing key insight about the factors which can predominantly dominate the adoption and use of technology.

In the second phase due to dearth of enough empirical evidences, this study used a mix of two parallel techniques namely case-based modelling and q-sorting with industry experts as an alternative to pre-pilot and pilot studies. Through Q-sort technique[11] the study tried to incorporate an alternate investigative viewpoint using telemedicine implementation experts and physicians involved in similar fields. Through Q-sorting three aspects were closely monitored: Inter-rater reliability, Cohen's kappa and raw agreement scores and the study continued for three rounds with distinct sets of experts till all the three values above 0.9 were achieved. However, since in q-sorting the subjective perspectives of the experts were only taken into consideration, we have substantiated our claim through development of two fact-based realistic cases in the context of already running telemedicine projects in Indian context to add to the clarity and get a more nuanced understanding about the factors affecting telemedicine implementation and adoption. From the systematic literature review, semi structured focused group interview followed by Q-sort, and small case-based propositions this study goes forward to put forth five key propositions which carry immense managerial and practitioner implications.

Case Study

While we were in the process of focused group discussion with the telemedicine technology experts, physicians and patients, we have made two distinct case studies which portrays in lucid manner how telemedicine facility can work, what are the facilities that are needed for a telemedicine center, and how well it can impact the adoption and implementation of telemedicine technology; thereby aiming at providing better healthcare services.

Case Study – I

A prominent Pan-India private healthcare service

provider, with key multi-specialty chain hospital network spread across India, has developed telemedicine network and has been providing telemedicine services in almost all states of India, and nine overseas countries from their seven tertiary care facilities across the country. Patients have been evaluated from the distances ranging from 120 to 4500 miles as there is a need the hospital has developed capability to fullfil the need. Facilities are available for tele-auscultation and for transmitting and viewing an echocardiogram live from a few centers. facility has Web-based software platform, to transmit electrocardiograms, images, ultrasound pictures, MRI and other reports.

In India where there is dearth of electricity and power outages are common, if due to some network or technical error web based live tele-consultancy process gets stuck up, this telemedicine service provider has designed process backups like transcript emailing and diagnosis mailing to avoid ambiguity and synchronize incomplete consultations. Even storage, retrieval and re-evaluation facilities are also provided to distant patients. All the teleconsultations are recorded and stored. The facility uses broadband, ISDN line or VSAT (Very Small Aperture Terminal) for transmitting data, images, video, audio and provides a superior healthcare. All process level cross-checks prevent variability and enhances standardized care service delivery.

Case Study – II

The second case is in the context of rural telemedicine, service their rural outposts from metropolitan centers. This leading telemedicine service provider have been serving in rural India, from its metropolitan centers, using hub and spoke model for delivering better healthcare. For achieving the success, they have done the partnership with the rural practitioners as they do not possess advanced skills but they have basic skills and follows the gyuideline. The facility provides the training and motivates physician by lucrative incentives for telemedicine, The facility has a technology for video conferencing and transmitting, image, audio, video text towards both the ends. These are aimed at enhancing the pervasiveness and standardized care delivery practice by prescription mailing to the patient with all the necessary reports generated by experts at telemedicine facility to increase trust building between technology, doctors and patients and trying to mimic the existing care delivery practices in brick and mortar setups.

PROPOSTITION DEVELOPMENT

As per the Information processing theory[12], a goof fit between the information processing needs and information processing capabilities will lead towards a better outcome which may be an antecedent for the adoption. Adoption describes the behavior of user when user is using the technology for the first time.

We have used Venkatraman's strategy framework for defining a 'fit as matching'[13] with leads to conclusion that proper matching of information processing needs and information processing capabilities required for adoption of a technology if anyone of the above mentioned constructs lacks either need or technology will not leads towards the fit[14] as matching which will not leads to the adoption and thereby reach of telemedicine.

INFORMATION PROCESSING NEEDS

For providing a healthcare services information should be processed in a proper way as asymmetries between information or wrong information will misleads the physician's decision and approach towards the treatment and can be resulted into the dired consequences like fatigue. So, here the need is information must be produced and passed through the integrated systems which can give real time insights of the patient's condition to the physician.

Another issue over here is uncertainty. There is always an uncertainty observed with the patient's health condition. For dealing with the uncertainty telemedicine providers have to invest in a partnership specific asset or develop their own assets at the villages. As described in a case study I telemedicine service provider has developed their own asset and some other providers as in case study II has done the partnership with rural physician and their clinic. In both the cases tasks are clearly devided to challenge the status quo.

Proposition 1 – only information processing needs without a capability to process the information will not leads towards the adoption of technology.

INFORMATION PROCESSING CAPABILTIES

With the needs, the capabilities required to match. Telemedicine has a capability like, remote testing and diagnosis[7,10], treatment time optimization, information pervasiveness[6]. Telemedicine technology uses the web-based technology and thus remote diagnosis and

testing can be enabled. With the web-based credentials, the security of data can also be achieved as medical records cannot be handover to the unauthorized person, but the transparency so reports can be created between the physician and patient which will leads towards the patient's satisfaction for the healthcare services[16]. With the treatment time optimization physician can take care of a more patient within a stipulated time and thus the issue of access to care can be resolved as travelling time for doctor as well as patient will significantly decreased.

Proposition 2 – Only capability to process the information is useless if there is no need to use the information and will not leads to the fruitful outcome of adopting the same.

FIT AS MATCHING

There are six dimensions for fit on a strategic point of view[13], and we have used 'fit as matching' in the operational perspective rather than the strategic perspective to observe the adoption behavior. The information processing theory[12] suggests that, proper matching should be there between data processing needs and telemedicine capabilities to enhance the adoption of telemedicine technology technology. In the era of industry 4.0 telemedicine can be combined with the other technologies and concepts like, IoT, healthcare analytics, artificial intelligence for healthcare, which provides a better capability to process the data need in near real time.

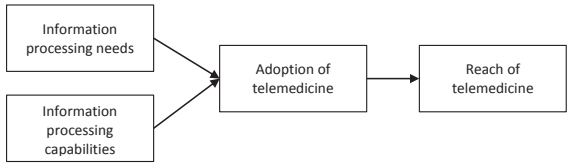
This suggests that with the minimal efforts the fit can be achieved, which will lead to the adoption of technology, because as per TAM perspective[8] person will use the technology for the first time if user perceives the usefulness of the technology.

Proposition 3 – When a fit is created between the need and capabilities for processing the information, then only the technology can be adopted.

ADOPTION

As per TAM perspective[8], if user has used the technology once and found it useful, then the probability of using it for second time and so on is higher. With the promotion of technology to others, user also start adopting a technology with cognitive thinking ability and the reach can be created.

Proposition 4 – Adoption of technology will create the reach for telemedicine technology as more users starts to adopting the telemedicine.



Proposed Model

IMPLICATIONS

MANAGERIAL IMPLICATIONS

Forim plementation of telemedicine hospital management must invest on it specifically in the partnership related assets which we have discussed, as telemedicine is able to provide high returns on investment as only one-time technology cost is there, but after implementation more patients can be handled swiftly which increases the patient's satisfaction. For the constraints related to technology Indian Space Research Organization (ISRO) has already launched a satellite, for an exclusive use of telemedicine and healthcare technology, which can have a wide reach and range of connectivity which increases the capability. Hospital management also supports the training program for the telemedicine operations for doctors and telemedicine operators, as training can motivates the usefulness, adoption and reach of technology.

SOCIETY AT LARGE

Government should also take the initiatives and make a telemedicine center at government hospitals in a metropolitan city, on the other end, primary healthcare center or "Aanganwadi" in the villages should be made as a teleconsultation program – which is connected with one or other hospitals with government as well as private telemedicine set up to decrease the uncertainty of partnership and provide an access of healthcare services to the last mile. These types of initiatives will satisfy the need of processing the information with the merged capability and can achieve a good fit, which can helpful to increase the reach of telemedicine at the end, as telemedicine is able to provide the superior healthcare services to the last mile at affordable cost.

ACADEMIC IMPLICATIONS

Researchers and scholars can remove the

technological as well as managerial constraints which are hurdle in the implementation and adoption of technology by achieving the good fit. moreover, how to enhance the reach and adoption for telemedicine especially in India, as India is a country with wide variety of geography, psychology and interior villages where reach is an issue. Moreover, in which disease condition and for which disease how telemedicine technology can be used effectively and efficiently is an area for research.

FUTURE SCOPE

Scope of converting the proposition into testable hypotheses to be tested empirically.

Ethical Clearence: As it is management study and no experimentation done in the laboratory no ethical clearance needed

Source of Funding:- Self

Conflict of Interest:- Nil

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An Empirical Relationship between Organisational Culture and Performance Management

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ABSTRACT

The main aim of this study is toidentify the factors determining organisational culture and to find the relationship between organisational culture and Performance Management.Organisational culture affects the performance management directly. The researcher used regression analysis to find the results. It finds that there is a positive relationship between the organisational culture and performance management and the good organisational culture achieved the firm's goal and improve the employee's performance.

Keywords: *Organisational culture, Organisational Performance*

INTRODUCTION

Organizational culture is *defined* as the underlying beliefs, assumptions, values and ways of interacting that contribute to the unique social and psychological environment of an *organization*. Also, *organizational culture* may influence how much employees identify with their *organization*(Schrodt, 2002).

Organizational culture and performance relation has been examined by many researchers (Ogbonna& Harris, 2000; Rousseau, 1990; Kotter &Heskett, 1992; Marcoulides& Heck, 1993), not much research has been done on organizational culture as a contextual factor of performance management (Magee, 2002).

Organizational culture works a lot like this. Every company has its own unique personality, just like people do. The unique personality of an organization is referred to as its culture. In groups of people who work together, organizational culture is an invisible but powerful force that influences the behavior of the members of that group.

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Organizational culture is a system of shared assumptions, values, and beliefs, which governs how people behave in organizations. These shared values have a strong influence on the people in the organization and dictate how they dress, act, and perform their jobs. Every organization develops and maintains a unique culture, which provides guidelines and boundaries for the behavior of the members of the organization.

IMPORTANCE OF ORGANISATIONAL CULTURE

The culture decides the way employees interact at their workplace. A healthy culture encourages the employees to stay motivated and loyal towards the management.

The culture of the workplace also goes a long way in promoting healthy competition at the workplace. Employees try their level best to perform better than their fellow workers and earn recognition and appreciation of the superiors. It is the culture of the workplace which actually motivates the employees to perform.

Every organization must have set guidelines for the employees to work accordingly. The culture of an organization represents certain predefined policies which guide the employees and give them a sense of direction at the workplace. Every individual is clear about his roles and responsibilities in the organization and know how to accomplish the tasks ahead of the deadlines.

No two organizations can have the same work culture. It is the culture of an organization which makes it distinct from others. The work culture goes a long way in creating the brand image of the organization. The work culture gives an identity to the organization. In other words, an organization is known by its culture.

The organization culture brings all the employees on a common platform. The employees must be treated equally and no one should feel neglected or left out at the workplace. It is essential for the employees to adjust well in the organization culture for them to deliver their level best.

Organizational culture and performance relation has been examined by many researchers (Ogbonna& Harris, 2000; Rousseau, 1990; Kotter &Heskett, 1992; Marcoulides& Heck, 1993), not much research has been done on organizational culture as a contextual factor of performance management (Magee, 2002).

In this article the researcher discuss the relationship between the organisational culture and Performance management ,the factors determining organisational culture.

REVIEW OF LITERATURE

Angelo S. et al(2006) Performance Appraisal, Performance Management and Improving Individual Performance: A Motivational Framework. Journal compilation USA. Performance appraisal has been the focus of considerable research for almost a century. This research has resulted in very few specific recommendations about designing and implementing appraisal and performance management systems whose goal is performance improvement.We review these trends and their genesis, and propose a motivational framework as a means of integrating what we have learned and generating proposals for future research that focus on employee's performance improvement[1].

UlMujeeb et al(2011). Relationship between Organizational Culture and Performance Management Practices: A Case of University in Pakistan.The aim of this study is to expand the base of knowledge and empirically test the relationship between the components of organizational culture and performance management practices. The regression and correlation statistical analysis were used. The results from the statistical analysis show that, involvement is highly correlated with consistency and adaptability. Similarly, the other dimensions of organizational culture have a positive significant relationship with the performance management practices[6].

Maastricht (2011)The impact of performance management on the results of a non-profit organization Andre ´ de Waal Centrefor Organizational Performance. International Journal of Productivity and Performance Management Vol. 60 No. 8, 2011 pp. 778-796. This article aims to describe the results of a study that explored the quantitative impact of performance management on the results of a non-profit organization. The research shows that several key activities related to the introduction of performance management have an impact on the results of an organization although not always in an expected positive way[3].

Pamela F. Resurrection,(2012) Performance Management and Compensation as Drivers of Organization Competitiveness: The Philippine Perspective.International Journal of Business and Social Science. Vol. 3 No. 21; November 2012. The study was conducted to determine the extent of implementation of select performance management and compensation practices in Filipino-owned SMEs and its underlying relationships with organizational competitiveness. This study found that human resource management practices in performance management and compensation, particularly employee benefits were all found to be significant predictors of organizational competitiveness. This finding signify that Filipino – owned companies are giving more emphasis on employee benefits to support its thrust of achieving competitiveness, further suggesting that employees are more motivated to perform if employee benefits that allows flexibility and convenience are provided[4].

Hsi-Ying Hsieh(2015)The Influence of Leadership Style and Corporate Culture on Organizational Commitment and Job Performance - A Comparison between a Local 5-star Hotel and an International Chain Hotel in Taiwan.Proceedings of the Third Asia-Pacific Conference on Global Business, Economics, Finance and Banking (AP15Singapore Conference) ISBN: 978-1-63415-751-3 17-19 July 2015 Paper ID: S539.This study examined the influence of corporate culture and leadership styles on organizational commitment and job performance in a local 5-star hotel and an international chain hotel in Taiwan. The combined samples show

innovative and supportive cultures, and a consideration leadership style, had positive effects on employee organizational commitment and job performance, with the influence of an innovative culture on employee organizational commitment and job performance, and the influence of a consideration leadership style on employee organizational commitment, being stronger in the sample of International Chain Hotel[2].

Parvee Ahmed AlamPerformance Management System: A Conceptual Framework. In this paper an attempt has been made to provide a conceptual framework through reviewing the relevant literature with reference lo Perfonnance Management System (PMS)-its genesis and process; its linkage with Human Resource Systems, the impact it has in the business arena as well as the modem trends in PMS. Allempt has also been made to touch upon the, how-so-ever limited, literature in this field focusing on the Indian scenario[5].

OBJECTIVES OF THE STUDY

To identify the factors determining organisational culture.

To find the relationship between organisational culture and Performance Management.

HYPOTHESES OF THE STUDY

There is no significant influence among the variables of organisational culture.

There is no significant relationship between the organisational culture and Performance Management.

ANALYSIS OF T-TEST

In the case of Organisational culture the researcher identifies that the following order is perceived very important for the reliability measure

Table – 1 One-Sample statistics

	N	Mean	Std. Deviation	Std. Error Mean
External parties	100	3.60	1.279	.128
Goals of the firm	100	3.17	1.457	.146
Management style	100	3.17	1.303	.130
Employees involvement	100	2.61	1.675	.168
Goodwill of thefirm	100	3.07	1.328	.133

Table – 2 One-Sample Test

	Test Value = 0						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		
					Lower	Upper	Rank
External parties	28.142	99	.000	3.600	3.35	3.85	1
Goals of the firm	21.760	99	.000	3.170	2.88	3.46	2
Management style	24.327	99	.000	3.170	2.91	3.43	3
Employees involvement	15.581	99	.000	2.610	2.28	2.94	5
Goodwill of the firm	23.123	99	.000	3.070	2.81	3.33	4

From the above table it can be found that the mean values range from 2.610 to 3.600 with the respective standard deviation and standard error. The t values 28.142, 21.327, 24.327, 15.581, 23.123, are statistically significant at the 5 % level. The t values are statistically insignificant at 5% level. Therefore, it can be concluded, among the 5 factors external parties which is involved in the firm's transactions are affected more than the other factors.

INFLUENCE OF ORGANISATIONAL CULTURE ON PERFORMANCE MANAGEMENT

The cultural factor covers five variables and it subsequent influence over Performance management is measured through linear multiple regression analysis. The results are shown below

Table – 3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.983[a]	.967	.965	.273

a. Predictors: (Constant), Factor5, Factor4, Factor1, Factor2, Factor3

In the above table persist that R=.983 R square = .967 and adjusted R square .965. It indicates that the cultural variable creates 97.7% variance over the Performance management. The cumulative influence of five variables of cultural over Performance management is formulated through the following one way analysis of variance.

Table – 4 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	204.021	5	40.804	546.441	.000[b]
	Residual	7.019	94	.075		
	Total	211.040	99			

a. Dependent Variable: performance management

b. Predictors: (Constant), Factor5, Factor4, Factor1, Factor2, Factor3

It was inferred in the above table that f=546.441 p=.000 are statistically significant at 5% level. This indicates to all the five variables cumulatively responsible for Performance management. The individual influence of all this five variables is clearly given in the following co-efficient table.

Table – 5 Coefficients[a]

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	-.259	.088		-2.937	.004
	External parties	.479	.059	.419	8.111	.000
	Goals of the firm	.488	.064	.487	7.599	.000
	Management style	.003	.102	.002	.026	.979
	Employees involvement	-.004	.031	-.004	-.120	.904
	Goodwill of the firm	.114	.107	.104	1.061	.291

a. Dependent Variable: performance management

It was presented in the above tableExternal parties (Beta=.419, t=-8.111, p=.000),Goals of the firm(Beta=.487, t=7.599, p=.000),Management style (Beta=.002, t=.026, p=.979), employee's involvement (Beta=-.004, t=-.120, p=.904),Goodwill of the firm (Beta=.104, t=1.061, p=.291)are statistically significant at 5% level. This indicates that the goals of the firm achieved because of organisational culture and it influencedin the performance management.

FINDINGS AND CONCLUSIONS

Organisational culture affects the performance management directly. There is a positive relationship between the organisational culture and performance management.

Good organisational culture achieved the firm's goal and improve the employee's performance.

Good will of the firm also determined by organisational culture.

External parties such as suppliers, creditors etc., also affected because of organisational culture.

Thus, Organisational culture influenced the performance management and the firm should have to develop good cultural traits to achieve the mission.

Conflict of Interest – Nil

Ethical Clearance – Taken from UGC Committee

Source of Funding- Self

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Three Dimensional Finite Element Stress Analysis of Two and Four Implant Supported Prosthesis

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ABSTRACT

Purpose: The biomechanical behavior of the two-implant-supported overdenture was compared with that of four-implant supported mandibular overdenture using the three dimensional finite element method (FEM). Thereby evaluating the von Misses stresses induced on the implants under different loading simulations.

Materials & Method: Three dimensional models representing mandible restored with two-implant-supported and four-implant-supported prosthesis were developed in the three dimensional design software and then transferred into FEM software. The models were then subjected to four different loading simulations (full mouth biting, canine disclusion, load on cantilever, load in the absence of cantilever). The maximum von Mises stresses were localized and quantified for comparison.[1]

Results: Among the three models, under all loading simulations, the maximum stress concentrations were along the neck of the implant. The stress levels for full mouth loading simulation was highest for two implant supported overdenture design when compared with the four implant retained overdenture design. In both the designs, the least stress was when the implants were loaded in a lateral direction. The stress levels for cantilever and non-cantilevered designs were nearly the same for all the simulated designs.

Conclusion: When tested under different loading simulations, both models showed similar location and distribution of stress patterns. Thus from the study it can be concluded that the four implant retained over denture design is a better treatment option for the atrophic edentulous ridges and induces comparatively less amount of stresses on the edentulous ridges. Therefore the overall longevity of the prosthesis is greatly enhanced.

Keywords: *atrophic mandible, biomechanics, finite element analysis, implants supported prosthesis. overdenture*

INTRODUCTION

The high success rate and patient satisfaction has made it possible for implants to be used extensively for rehabilitation of partially and completely edentulous jaws with fixed or removable prosthesis [2]. However marginal bone loss is a common occurrence in implant supported prosthesis which can be attributed to compromised oral hygiene and unfavorable biomechanical factors [1,2].

Compromised oral hygiene needs to be dealt with by motivating the patient to strictly follow good oral hygiene and also by periodic recall and checkup. However precise analysis and sound treatment plan is necessary for controlling the biomechanical factors.

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Various factors like size of implant, its location in the edentulous ridge, implant design, quality & quantity of bone and the host overall health & maintenance play a substantial role in load transfer and stress concentration. Specific factors like force factors during loading, the dynamic nature of loading, mechanical and structural properties of the prosthesis are the factors involved in design of an implant prosthesis[2,6]. However accurate data on such parameters are incomplete.

Hence the present study evaluates and compares the stress patterns in the edentulous mandibular bone around two implant retained with that of four implant retained over denture under different loading conditions using finite element analysis.

Aim

To compare the stress patterns in edentulous mandibular bone around two implant retained over denture and the prosthesis restored with four implant retained over denture.

Objective

To compare the biomechanical behavior of the two implant retained over denture with that of four implant retained over denture using finite element analysis.

To compare the Von Misses stresses induced on the implants under different loading simulations.

MATERIAL & METHOD

After obtaining approval from the institutional ethical and research committee, the study was carried out at

Department of Prosthodontics and Crown & Bridge, Manipal College of Dental Sciences, Manipal Academy of Higher Education, Manipal, Manipal.

Department of Aeronautical Engineering, Manipal Institute of Technology, Manipal Academy of Higher Education, Manipal, Manipal.

Armamentarium used for the study

CT Scan of edentulous mandible

- Replace Select Tapered TiU NP 3.5 x 13mm (Nobel Biocare)
- The Profile Projector (METZ- 801)
- Cylindrical Retainer of 4mm diameter.
- ANSYS - 11 Workbench Software.

Preparation of FEM model of the Edentulous Mandible. [1,3]

A Computerized tomography image of the human edentulous mandible was obtained and introduced into the Computer Aided Design Software. Using the ANSYS software, the CT image of the mandible was later simplified into an arc shaped bone block with dimensions of 7.5 mm thick and 15mm high. A 1mm cortical bone layer was established overlying the entire mandible whereas trabecular bone was used in the internal structure, simulating the type III bone. Once the computerized 3-Dimensional model was obtained, incorporation of the implant design into the model was planned. The Young's Modulus and Poisson's ration used for the study is given in table 1.

Preparation of the FEM implant model [1,3]

The study was done to compare the stress patterns in the edentulous mandible under various implant supported overdenture designs, so the accuracy and contour of the threaded implant was a major concern. But the contour, shape and depth of the threads in the implant could not be evaluated and reproduced in the 3-dimensional model with the help of the computerized tomography, hence an instrument called 'Profile Projector Optical System' was used in this study. The values that were obtained from the profile projector were then used to prepare an accurate 3-D model of the threaded implant along with the retainer.

All profile projectors display magnified images on an appropriate viewing screen, as an aid to more precise determination of dimension, form and occasionally physical characteristics of sample parts. These optical projectors are able to display a two dimensional projection of a part rather than a simple linear dimension as with most other gauging devices.

This instrument creates work piece image on the projection screen at desired magnifications (10x, 20x, 50x) to provide accurate dimensional measurement as well as inspection of the contour and surface condition of the work piece.

The METZ- 801 features a large Projection Screen 300mm diameter and the combination of high performance projection lens and an optical system minimizing the magnification error, which may occur due to insufficient or improper focussing and ensures accurate measurements over the entire projection screen. The accuracy of this instrument is known to be 0.001mm.

Preparation of the working model [1,3]

Three dimensional working models were constructed using 3D computer aided design software (ANSYS). The models represented the mandible restored with 4 implant supported prosthetic design and the design restored with the All On Four Concept. A rigid type III gold prosthetic bar, 6mm thick and 4mm high and in the shape of an arc was then designed and joined to the abutments.[1]

For the 3-Dimensional two implant supported prosthesis model, the threaded implants were strategically placed vertically in the region of lateral incisors bilaterally.

For the 3- Dimensional four implant supported prosthesis model, in addition to the mesial implants placed bilaterally, distal implants were vertically placed bilaterally in the premolar region.

To evaluate and compare the distribution of stresses on the implant on the three models, four loading situations were simulated in each model using load values similar to those of functional bite movements from patients with implant supported prostheses.

● Loading 1: Full mouth biting – bilateral and simultaneous vertical static loads of

- 200 N was applied on the occlusal surface of the first molars (Cantilevers)

- 150 N on the occlusal surface of second premolars

- 150 N on the occlusal surface of first premolars

- 100 N on the distal of canines

● Loading 2: Lateral Load – Unilateral static load of 50 N applied in the region of left canine.

● Loading 3: Cantilever Load – Unilateral vertical static load of 200 N was applied on the left cantilever.

● Loading 4: Load without the cantilever - Unilateral vertical static load of 200 N was applied in the region adjacent to the left second premolar, simulating absence of cantilever.

The results of the mathematical solutions were later converted into visual results and expressed in colour gradients, ranging from shades of red, orange, yellow, green and blue, with red representing highest stress values. The stress values in the three models were collected and compared, with the points of greatest magnitude identified by the Von Mises equivalent stress levels.

This study was carried out on FEM models simulating two implant retained prosthesis and four implant retained prostesis under a) Full mouth load, b) Lateral load, c) Cantilever load, d) Load without cantilever.

RESULTS

The results of the numerical analysis are shown in Table - 2 for Von Mises stresses occurring for the FEM models.

The Table 2 represents the biomechanical behavior of the two implant supported over denture FEM modes when subjected to different loading simulations. The graph depicts maximum stress levels during full mouth loading simulation which was 2226.7 Mpa followed by cantilever loading simulation which was 813.09 Mpa and load without cantilever shown as 531.39 Mpa. The least stress for this model was found during the lateral loading simulation which was 64.76 Mpa.

The table 2 also represents the biomechanical behavior of the four implant supported over denture FEM models under different loading simulations. The maximum stress level in this model was found during the full mouth loading simulation which was 303.51 Mpa followed by load simulating cantilever loading which was 187.34 Mpa and load simulating load without cantilever which was 125.09 Mpa. The least stress was found during lateral loading shown as 57.35 Mpa. The stress levels in the four implant simulation were comparatively much less than the two implant supported overdenture model.

From the analysis it can be inferred that among the two models, the stress levels for full mouth loading simulation was more for two implant supported overdenture design and the least for four implant supported overdenture design. For both the designs,

the least stress was when the implants were loaded in a lateral direction. The stress levels for cantilever and non-cantilevered designs were nearly the same for all the simulated designs. From the study we also found out that maximum stress concentration was near the neck of the implant.

Table – 1 Young's Modulus & Poisson's Ratio used in the study[1] .

MATERIAL	*YOUNG'S MODULUS*	*POISSON'S RATION*
CORTICAL BONE	13.7	0.30
TRABECULAR BONE	1.37	0.30
TITANIUM	115	0.35
TYPE III GOLD	100	0.30

Table – 2 Maximum stress values recorded during different simulations.

	TWO IMPLANT (Mpa)	*FOUR IMPLANT (Mpa)*
Full Mouth biting	2226.7	303.51
Lateral Load	64.76	57.35
Cantilever Load	813.09	187.34
Load without Cantilever	531.39	125.09

DISCUSSION

In the patient's mouth, the dental implants are frequently subjected to multidirectional loads originating from the stomatognathic system [2,3]. The osseointegrated implant interface is rigid and transmits the occlusal loads directly into the underlying bone. These loads lead to stress on the residual bone leading to accelerated bone resorption. Proper analysis of the stress distribution and subsequent implant treatment planning is necessary when implant supported over dentures are planned for the completely edentulous patients [3,4].

The finite element method is a numerical technique for structural analysis. This technique involves dividing the structure into simpler parts called finite elements. These finite elements are collectively called the mesh. Their assembly at the corner are called the nodes. When the nodes are subjected to certain loads, it results in change in the mechanical model. Compilation of all these results are done by the ANSYS software in the computer to obtain accurate results. The finite element analysis has been used to study stress distribution in implants [4,5,6].

Keeping in mind the consequences of unwanted stresses, this study was an attempt to compare the Von Mises Stresses around the implant by different loading conditions, on two different finite element models. The models were simulated on the basis of implant number, position, angulation and the type of prosthesis which is a Type III gold bar.

Thereby attempting to analyze the best treatment option between the two.

From the study it was found that the four implant retained over denture substantially reduced stress concentration and was better able to distribute the stresses when compared to the two implant retained over denture design. Hence for the long term success and patient comfort the four implant over denture design should always be preferred over the two implant design.

Further analysis in this regard by comparing the four implant design with that of All-On-Four and six implant over denture designs are the need of the hour. Thus enhancing rehabilitation options for completely edentulous patients with atrophic ridges and close proximity to important anatomical landmarks.

CONCLUSION

The results of the preliminary investigation suggests that the four implant supported over denture design for rehabilitation of the completely edentulous patients is better option when compared to the two implant supported over denture design. The load transferred by the two implant over denture design leads stress concentration and can lead to severe resorption and eventually may lead to implant failure. Hence the four implant design should be used routinely for the long term success of the prosthesis.

Conflict of Interest : Nil

External Funding : Nil

Ethical Clearance & Research Committee Clearance : Manipal College of Dental Sciences, Manipal (A constituent of Manipal Academy of Higher Education, Manipal)

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Awareness of Smoke-free Legislation (Section 4 of COTPA) among Owners or Person in-Charge of the Public Places in Ramanagara City

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ABSTRACT

Background: Strong smoke-free legislation continues to be the most widely adopted measure for protecting people from tobacco smoke and to maintain smoke-free environment the owners or persons in charge of public places must be aware of Smoke-free legislation. The objective of the study was to assess the awareness of Smoke-free legislation (section 4 of COTPA) among the owners/person in-charge of public places in Ramanagara city, Karnataka State.

Method: A Cross sectional study was conducted among owners or person in-charge of all the registered public places of Ramanagara city, using a protocol developed by the Bloomberg Initiative to Reduce Tobacco Use and its partners. The data was collected and compiled in MS excel and was analyzed using SPSS software version 20.0

Results: Out of 184 public places, majority were educational institutions(35.3%), followed by restaurants(25%), government offices(21.7%), bars(9.2%), hospital buildings(6%), cinema halls(1.6%), railway station and City bus stand(1%). 115 owners/person in-charge participated in the study, only 42(36.5%) were aware of smoke-free legislation in public places and when asked about the rules under the law, majority (95.2%) of them said 'No person should smoke tobacco in public places and majority (63.4%) of them said lack of awareness about the law was the reason for non-compliance.

Conclusion: Sustained awareness campaign among owners/person in-charge of public places about smoke-free legislation is the need of the hour and they should be educated about the harmful effects of smoking and the importance of smoke-free places.

Keywords: *Public places, COTPA Act, Smoke free legislation, Awareness.*

INTRODUCTION

Tobacco is the foremost preventable cause of premature adult death in the world today, killing half of its users.[1] Tobacco kills nearly 6million people each year of which more than 5 million are the result of direct tobacco use and the annual death toll in the world could rise to 8 million by 2030.[2]

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Globally, there are 1.1 billion smokers.[3] Smoking is the most important cause of lung cancer to the extent that over 80% of lung cancers are caused by smoking.[4] Smoking causes many other diseases, including cancers, heart disease --globally, about 11% of cardiovascular deaths are caused by smoking: [5] stroke, chronic bronchitis, peptic ulcer and several other fatal diseases.[6]

India is the second largest producer and consumer of tobacco in the world. There are almost 275 million tobacco users in India[7] Each year tobacco use kills about 1 million Indians.[8]

Government of India also enacted the Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act (COTPA) in 2003. Later in 2008 provisions were reviewed and a comprehensive revised Smoke Free legislation 'Prohibition of Smoking in Public Places Rules, 2008 (section 4 of COTPA) came into effect from 2nd October 2008, redefining 'public places' so as to include all workplaces and authorizing personnel responsible for enforcement of law for maintaining smoke-free public places across the country. [9, 10]

Strong smoke-free legislation continues to be the most widely adopted measure for protecting people from tobacco smoke. Smoke-free environments not only protect non-smokers, they reduce tobacco use in continuing smokers and help smokers who want to quit.[11] To maintain smoke-free environment the owners or persons in charge of public places must be aware of Smoke-free legislation and relatively few studies have been conducted in South India particularly in Karnataka State regarding the same, hence an effort has been made to assess the awareness of Smoke-free legislation (section 4 of COTPA) among the owners/person in-charge of public places in Ramanagara city, Karnataka.

METHODOLOGY

Materials and Method

Source of data: Data was obtained by interviewing owners or person in-charge of the following public places of Ramanagara city, Ramanagara district, Karnataka

Based on the accessibility and feasibility the following public places were considered for the study Educational Institutions (private and government schools and colleges), Government offices, Hospital Buildings (private and government), Cinema Halls, Bars and Restaurants (eateries, canteens and fast foods), transit stations (city bus stand and railway station)

Study design: A Cross-sectional study

Study period: June 2015- January 2016 (6 months)

Study area: Public places of Ramanagara city, Ramanagara district, Karnataka.

Inclusion criteria:

In the current study public place was defined as any Educational Institutions, Government offices, Hospitals Buildings, Cinema Halls, Restaurants and Bars, City bus stand and Railway station in Ramanagara city and the Owners or the person in-charge of the same were included in our study.

Exclusion criteria:

Owners or the person in-charge of public places who were not available on three repeated visits and those who did not give consent to participate in the interview.

Unauthorized, unregistered, closed public places were excluded.

Sample size: All the public places registered in the respective departments of Ramanagara city were included in the study.

Study tool: Pre-tested, semi-structured questionnaire developed by the Bloomberg Initiative to Reduce Tobacco Use and its partners was used with appropriate modifications.

Method of data collection:

The study was conducted in public Ramanagara city with a population of around 95000 and area of 14.53sqkms with 31 wards[12] using a protocol developed by the Bloomberg Initiative to Reduce Tobacco Use and its partners (which include Campaign for Tobacco-Free Kids, Johns Hopkins Bloomberg School of Public Health and International Union Against Tuberculosis and Lung Disease).[13] The list of public places was obtained from the city municipal council office, block education office and District Statistical Office and was categorized into Educational Institutions, Hospital buildings, Government offices, restaurants, bars and cinema halls and transit stations (City bus stand and Railway station). According to the list 184 public places were present in Ramanagara City. Ethical clearance was obtained from the Institutional Ethical Committee.

A written consent was taken from owners or person in-charge willing to participate in the interview. A pre tested semi-structured questionnaire developed by the Bloomberg Initiative to Reduce Tobacco Use and its partners[13] with appropriate modifications was used to interview the owners/person in-charge.

DATA ANALYSIS

The data was collected and compiled in MS excel

and was analyzed using SPSS software version 20.0 and tabulated accordingly. Descriptive statistics was used as necessary; all qualitative variables were presented as frequencies and percentages. Chi square test of significance and Fischer exact test of significance was applied and p value less than 0.05 were considered as statistically significant.

RESULTS

In the current study a total of 184 public places were visited, which includes 84 government and 100 private public places. For the study purpose, all the selected public places in Ramanagara city were divided into 7 broad categories.

Out of 184 public places, majority were educational institutions 65(35.3%), followed by restaurants 46(25%), government offices 40(21.7%), bars 17(9.2%), hospital buildings 11(6%), cinema halls 03(1.6%), railway station and City bus stand 02(1%).

In the present study out of 184 public places visited, Owners/Person in-charge of 115(62.5%) public places participated in the Interview, 37(20.1%) did not give consent and 32(17.4%) were not available even after repeated (3) visits.

Table 1: Demographic details of Owner/Person in-charge of public places who participated in the Interview

Demographic details		**Frequency (%)**
Age (years)	20-39	44 (38.3)
	40-59	65 (56.5)
	>60	6 (5.2)
	Total	115 (100.0)
Sex	Male	88 (76.5)
	Female	27 (23.5)
	Total	**115 (100.0)**
Religion	Hindu	66 (57.3)
	Muslim	45 (39.2)
	Christian	4 (3.5)
	Total	115 (100.0)
Education	Illiterate	----
	High School	9 (7.9)
	Pre-University	12 (10.4)
	Graduation	23 (20.0)
	Post-graduation	71 (61.7)
	Total	**115 (100.0)**

Cont... **Table 1:**

Out of 115 Owners/Person in-charge of public places, 65 (56.5%) belonged to the age group of 40-59 years whereas 6 (5.2%) belonged to the age group >60 years and the mean age of the participants was 31 years, 88(76.5%) were males and 27(23.5%) were females. Most of them 66(57.3) were Hindus and 4(3.5%) were Muslims. Most of them were Post-graduates 71(61.7%) and none of them were illiterates. **(Table 1)**

It is observed that 65(56.5%) of 115 were Owners or Principal, 40(34.8%) were Managers and 10(8.7%) were Person in-charge of public places.

Table 2: Awareness of Smoke-free legislation among the Owners/person in-charge of different categories of public places

Public places	**Awareness of Smoke-free law in public places**		**Total**
	Yes	**No**	
Educational Institutions	10 (18.5)	44 (81.5)	54 (100.0)
Hospital Buildings	3 (50.0)	3(50.0)	6 (100.0)
Government Offices	11 (55.0)	9 (45.0)	20 (100.0)
Restaurants	11(52.4)	10 (47.6)	21 (100.0)
Bars	3 (30.0)	7 (70.0)	10 (100.0)
Cinema Halls	2 (100.0)	0 (0.0)	2 (100.0)
Railway Station and city Bus Stand	2 (100.0)	0 (0.0)	2 (100.0)
Total	42 (36.5)	73 (63.5)	115 (100.0)

Among the owners/person in-charge, 42(36.5%) were aware of smoke-free legislation in public places. It was also observed that manager/ person in-charge in all Cinema halls, railway station and city bus stand were aware of the smoke-free law. Most 11(55%) of the managers at government officers were aware of the Smoke-free legislation in public places, followed by hospital buildings where the awareness among owner/ person in-charge was 3(50%) and least awareness of 18.5%(10) was found among Principals of educational institutions. **(Table 2)**

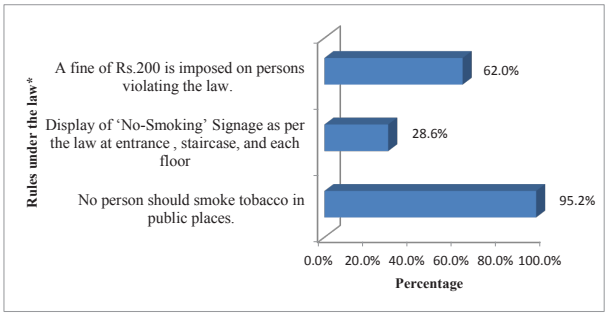

Figure 1: Bar diagram showing the Owners/person in-charge's awareness of rules under the Smoke-free law: (n=42)

*Multiple Responses

Owner/person in-charge who were aware of smoke free legislation when asked about the rules under the law, majority (95.2%) of them said 'No person should smoke tobacco in public places', 62.0% of them said 'A fine of Rs.200 is imposed on persons violating the law' and only 28.6% of them were aware that 'No-Smoking' signage should be displayed as per the law at entrance, staircase, and each floor'**. (Figure 1)**

Table 3: Source of Awareness of Smoke-free legislation among Owners/manager/person in-charge of public places

Source of awareness of Smoke-free Law*	Number	Percent (%)
Radio	18	42.8
News channel	23	54.8
Internet	20	47.6
Newspaper	32	76.2
Ads in Cinema theatres	38	90.5
Enforcement officers	40	95.2

*Multiple responses

The highest source of awareness of smoke-free legislation among owners/person in-charge of public places were enforcement officers (95.2%) next highest was ads in cinema theatres (90.5%) and least source of awareness was radio (42.8%). (**Table 3)**

Table 4: Association between awareness of Smoke-free legislation among owners/person in-charge of public places and compliance to Smoke-free Indicators

Parameters Aware (n=42)		Smoke free legislation Not aware (n=73)		Chi square test	p- value
'No smoking' signage displayed	Yes	26(61.9)	17(23.3)	16.98	<0.001
	No	16(38.1)	56(76.7)		
Signage Comply with Smoke-free law	Yes	07(16.7)	01(1.3)	0.0035*	<0.001
	No	35(83.3)	72(98.7)		
No active Smoking found Indoors	Yes	38(90.5)	68(93.1)	0.264	0.607
	No	04(9.5)	05(6.9)		

Cont... **Table 4: Association between awareness of Smoke-free legislation among owners/person in-charge of public places and compliance to Smoke-free Indicators**

No active Smoking found at the entrance/exit	Yes	30(71.4)	56(76.7)	0.394	0.529
	No	12(28.6)	17(23.3)		
Smoking Aids not found	Yes	41(97.6)	65(89.3)	0.151*	0.151
	No	01(2.7)	08(10.7)		
Cigarette butts/ bidi stubs not found	Yes	23(54.8)	50(68.5)	2.168	0.140
	No	19(45.2)	23(31.5)		
Absence of Odor emanating from cigarettes or bidi	Yes	35(83.3)	55(75.3)	1.006	0.317
	No	07(16.7)	18(34.7)		

*Fischer exact test

Awareness of Smoke-free legislation among owners/person in-charge and Display of 'No smoking' Signage , signage as per the law

Out of 42 owners/person in-charge of public places who aware of Smoke-free legislation 26(61.9%) of them had displayed one or more 'No smoking' signage and 7(16.7%) of them complied with specifications of 'No smoking' signage as given under COTPA act.

The association between display of 'No-smoking' signage, compliance to specifications of 'No smoking' signage as given under COTPA act in public places and awareness of Smoke-free legislation among owners/ person in-charge of respective public places was found to be statistically significant. **(Table 4)**

Awareness of Smoke-free legislation among owners/person in-charge and active smoking not found indoors/ entrance/exit , absence of smoking aids and odor

Among 42 public places whose owners/person in-charge of public places were aware of Smoke-free legislation, active smoking was not found indoors and at the entrance/exit in 38(90.5%) and 30(71.4%) public places respectively, smoking aids and cigarette butts or bidi stubs were not found in 41(97.6%) and 23(54.8%) public places respectively. There was absence of odor emanating from cigarette or bidi in 35(83.3%) public places.

There was no statistically significant association between absence of Cigarette butts/bidi ends, absence of odor and non-availability of smoking-aids in public places and awareness of Smoke-free legislation among owners/person in-charge of respective public places. **(Table 4)**

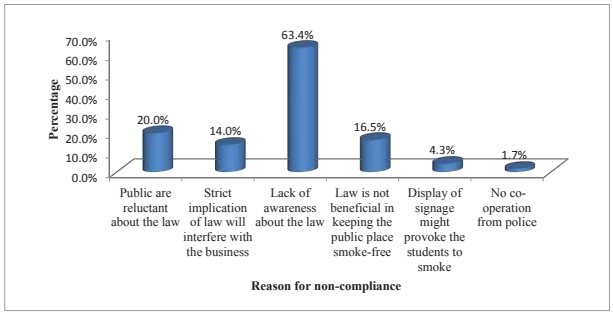

Figure 2: Cylinder diagram showing the Owners/ person in charge's reason for non-compliance to Smoke-free laws in different Public places

*Multiple response

Owners/person in-charge of public places when asked about the reason for non-compliance to Smoke-free laws in respective public places, majority (63.4%) of them said lack of awareness about the law, few

(4.3%) of the principals felt display of signage might provoke the students to smoke and 1.7% expressed non co-operation from police as the reason mainly in transit stations. (**Figure 2**)

DISCUSSION

In the current study, 36.5% of Owners/Person in-charge of public places was aware of Smoke-free law in public places (section 4 of COTPA) and among them majority (95.2%) said that 'No person should smoke tobacco in public places', 62.0% of them said 'A fine of Rs.200 is imposed on persons violating the law'.

According to a Tobacco Control Law Enforcement and Compliance study conducted in Odisha, India awareness about COTPA findings revealed that 80.8% of the respondents knew about the provision of the law prohibiting smoking in public places, only 6.7% had awareness about 'penalty' on smoking in public places.[14] In a study conducted in a district of North India by Goel et al, where most (84%) of the study participants were aware that smoking was banned in public places and half of them knew about the fine for violation of COTPA act[15].

In the present study, it was observed that, majority (80-100%) of the Owners/person in-charge of public thought that Smoke-free legislation is useful in keeping the respective public places smoke free and supported smoke-free law. In a study conducted in North India, nearly 90% of respondents supported smoke-free law COTPA.[16]

Around the world; countries which successfully introduced smoke-free laws have witnessed widespread public support for it. A survey carried out in Latin America showed that more than three fourth respondents supported smoke free public places.[17]

In the current study owners/person in-charge of Bar and restaurants expressed Strict implication of law would interfere with the business as the main reason for non-compliance to smoke-free legislation. However, in every country where comprehensive smoke-free legislation has been enacted, smoke-free environments are popular and result in either a neutral or positive impact on business.[11]

CONCLUSION

Only 36.5% of the owners/person in-charge was aware of Smoke-free law in public places. Sustained awareness campaign among owners/person in-charge of public places about smoke-free legislation is the need of the hour. Owners/person in-charge of public places should be educated about the harmful effects of smoking and the importance of smoke-free places.

Source of Funding: Self

Conflict of Interest: Nil

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Dens Evaginatus on a Permanent Mandibular Molar-Report of a First Case

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ABSTRACT

Dens evaginatus is a developmental anomaly in form of an accessory cusp. It arises during morpho differentiation stage due to abnormal proliferation of the inner enamel epithelium into the stellate reticulum of the enamel organ. Though mandibular premolars are most commonly affected teeth, there are case reports of dens evaginatus of maxillary molars. However, dens evaginatus of a mandibular molar has not been reported till date to best of our knowledge. Thus, this case report adds a rare form of presentation of dens evaginatus to the existing literature.

Keywords: *Dens evaginatus, Mandibular, Molar*

INTRODUCTION

Dens evaginatus (DE) is a developmental anomaly that arises during morpho-differentiation stage due to abnormal proliferation of the inner enamel epithelium into the stellate reticulum of the enamel organ. It is clinically seen in the form of an accessory cusp.[1,2]

The morphology of the accessory cusp has been described in the literature in multiple ways like abnormal tubercle, elevation, protuberance, excrescence, extrusion, or bulge. Accordingly DE is also referred as tuberculated cusp, occlusal tubercle, tuberculum anomalous, accessory cusp, supernumerary cusp, interstitial cusp, accessory tubercle, occlusal tuberculated premolar, Leong's premolar, odontome, odontoma (odontome) of the axial core type, evaginatus odontoma (evaginated odontome), and occlusal pearl.[2,3]

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Macroscopically, DE consists of a narrow extension of the pulp tissue within the dentinal core and an enamel cap. The condition can be either unilateral or bilateral.[4] Prevalence ranges from 0.5 to 4.3%, depending upon the population group studied. The condition is predominantly seen in people of Asian descent including North Indians and North American Indians.[4,5]

Though it's primarily seen in mandibular premolars on the occlusal surface between the buccal and lingual cusps, it has also been very rarely reported on molars, canines, and incisors.[6] However to best of our literature search, till date there is no report of involvement of a mandibular molar. This article presents a unique case of DE on the occlusal surface of a mandibular second molar.

CASE REPORT

A twelve years old female patient reported to the Department of Paedodontics and Preventive Dentistry with the complaint of malaligned upper and lower teeth. The medical history of the patient was non-significant. On intra oral examination, the patient was having complete set of permanent dentition, with crowded maxillary and mandibular anteriors and dental caries involving multiple teeth (16, 26, 17, 27 and 37). The interesting finding on intra oral examination was presence of a tubercle on the occlusal surface of mandibular right

second molar (47) (Fig 1a). The occlusion of the patient was undisturbed (Fig 1b), but the occlusal fissures of 47 were deep and discolored (Fig 1a). No catch or softness was present upon probing. The developmental anomaly on 47 was provisionally diagnosed as DE. Intra oral periapical radiograph (IOPAR) of 47 (Fig 2) revealed the presence of an extra cusp which contained pulpal extension within dentinal and enamel covering, thus confirming the provisional diagnosis. A treatment plan was formulated to seal the fissures and pits of 47 using pit and fissure sealant (Fig 3) along with attending other treatment needs of the patient.

Fig 1, a: Dens Evaginatus involving 47, b: Right lateral occlusion

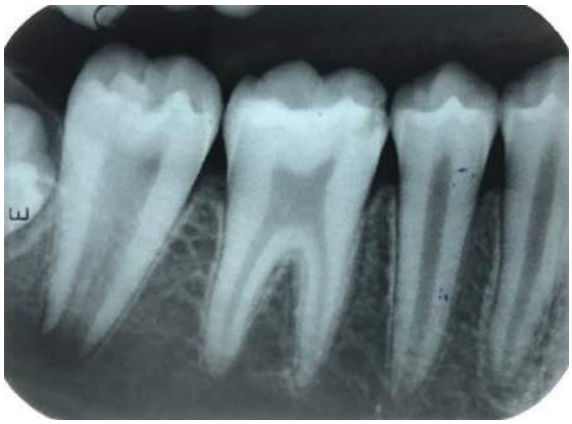

Fig 2: IOPAR of 47

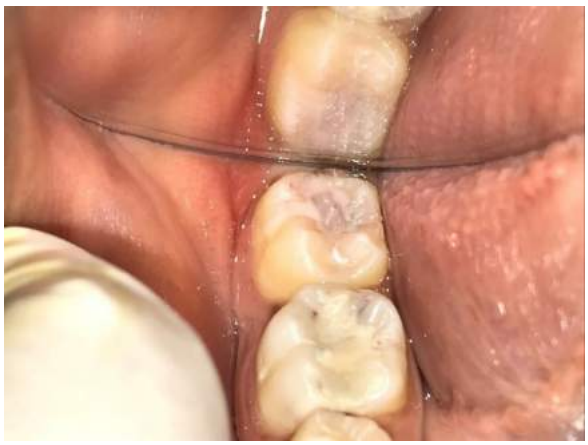

Fig 3: Post sealant application wrt 47.

DISCUSSION

DE is the variation of tooth morphology that is occasionally seen clinically.[7] The prevalence rate varies depending on the affected population, dental arch and tooth type. It is usually a bilateral presentation with female predilection.[2,7] Though DE occurs in both primary and permanent dentition, more frequently it's seen in the later. It can affect both anterior (referred as Talon cusps of the incisors) and posterior teeth.[2] Most common association of DE is with the premolars.[8,9] Literature also reports cases of DE on maxillary molars.[7,10] However, till date no reports are present describing DE on a mandibular molar and thus this case is unique and first of its kind.

Schulge (1987) has mentioned five types of DE for posterior teeth based on the location of the tubercle.[11] The present case is 5th type which is described as a tubercle arising from the occlusal surface obliterating the central groove. Also, based on Lau's classification on the basis of anatomical shapes of the tubercle, the present case can be categorized as of grooved/ ridged DE.[6]

The differential diagnosis for DE includes cusp of Carabelli. The cusp of Carabelli has been reported commonly in white population and is seen on the palatal aspect of the mesiolingual cusp of maxillary first molars. The presence of pulp within the cusp like tubercle of the former also has great diagnostic value, as the later doesn't contain pulp. Larger than the normal mesiodistal diameter is another additional distinguishing characteristic of cusp of Carabelli, whereas except for the tubercle crown of the tooth with DE has a normal anatomy. However, abnormal root patterns are very often linked with DE involved teeth.[2] The radiographic findings of our case revealed the presence of pulpal tissue within the tubercle and the presence of single root while the ususal tendency for the mandibular second molars is to have two roots.[12]

Caries has historically not been a factor for consideration regarding pulpal involvement for this entity. Due to the extension of the DE tubercle above the occlusal surface resultant malocclusion is a clinical concern. The abnormal wear or fracture of the tubercle due to occlusal trauma may even lead to pulpal exposure.[2] However, in the present case, no malocclusion was seen, but the fissures surrounding the tubercle were discolored. Thus no occlusal adjustments were done, only preventive treatment was offered by sealing the discolored fissures using pit and fissure sealant.

As it would be appropriate to observe the eruption of the affected teeth regularly to closely monitor the likely complications in terms of traumatic occlusion and pulp exposure,[5] the present case is also kept under regular follow up.

CONCLUSION

DE is a congenital developmental anomaly of the tooth. The structural anomaly itself does no harm to the patient. But because of its occurrence on the occlusal surface, it can be easily fractured due to occlusal forces, leading to pulpitis or pulpal necrosis. Thus with an eye to the future, the patient with this anomaly needs to be followed up and best treatment modalities available should be implemented when indicated.

Ethical Clearance- Taken from Institutional ethical committee

Source of Funding- Self

Conflict of Interest – NIL

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Knowledge and Perception of Patients in a Tertiary Hospital about Radiation and its Effects –A Survey

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ABSTRACT

Aim: To assess the knowledge and perception of patients about the relative ionizing radiation exposure and its effects in a tertiary hospital.

Material and method: A total of 171 subjects were selected from patients who have undergone Computed Tomography and X ray. The self-administered survey comprised of fifteen questions that were divided in two sets with a five point scoring scale. The first set of questions was based on patients' knowledge and perception on physician practices and the second set of questions was based on the knowledge and perception of patients on radiological examinations. The data were statistically analyzed using descriptive statistics where mean, standard deviation, and range was used to report the data.

Results: Among 171 study participants 61.99 % had an X-ray done and 38.01% had a CT-scan done The respondents who attended university/college show that they have greater awareness than respondents from the latter (35.6%) as compared to the participant who pursued their education in college but didn't enter university. The patients who finished primary and secondary school showed to have lesser awareness comparatively. The result indicates that those patients who had passed university/college had better awareness (39.1%) than the rest.

Conclusion: The overall knowledge and perception of radiation and its effect happens to be moderate based on the results. However, it is best if the patients are highly aware about radiation, dose, its risks, protection and justification, considering its hazard as a carcinogenic entity.

Keywords: *Radiation, awareness, patients, radiological examination.*

INTRODUCTION

Radiation has always been existent around us and our surroundings. However, mankind was not directly conscious of its existence until the end of the 19th century. Since the beginning of medical imaging with the first medical use of x-rays in 1896, the field of diagnostic imaging has come a long way and is one of the fastest growing areas of medical technology.[1] Ionizing radiation in medical imaging is a vital and powerful diagnostic tool that is constantly being used in medicine. Several studies have revealed that many doctors have reported in order to complete their diagnosis they always sent their patients for a radiologic examination. Even though all medical interventions have potential benefits, its potential risks cannot be ignored. [2] It is estimated that 2.0% of all the cancers may now be attributed to radiation from examinations due to CT scanning. Therefore, before undertaking any type of radiological examination, it is vital that the patients should recognize and apprehend the potential risks of radiation and its benefits towards them.

Furthermore, studies also show that health care practitioners are not familiar with the hazards related to radiation use. The doctors who prescribe various scans are unaware of the doses involved in various scans and

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often do not educate the patients on the possible risks that could arise out of these scans. However, many of the health care practitioners who may be aware of risks caused by radiation and its dose, struggle to acknowledge the concerns and questions of the patients as they may not be able to grasp any of the dose terminologies.[3]The study among patients in South India is imperative owing to the fact that not many studies have been reported among the South Indian population in specific and that many patients are deemed ignorant when it comes to the after-effects of radiation.

Radiation, considering its importance as a carcinogenic entity should therefore, be taken seriously and knowledge about it considered a top requisite for not only the patients but the general public too. The purpose of this study was to assess the knowledge and perception of patients about the relative ionizing radiation exposure and its effects in a tertiary hospital.

METHODOLOGY

We performed a cross sectional study on patients who were 18 – 55 years of age by administering a close-ended survey questionnaire. The Institutional Ethics Committee at Kasturba Hospital approved the study protocol.

The study was conducted from April 2018 to July 2018 in a tertiary hospital. We excluded patients who were unconscious or cognitive and those who weren't willing to sign informed consent thereby not willing to participate. The questionnaire was in English and Kannada, and those patients who spoke other languages were encouraged to take part if they understood the latter two and could answer the questions at ease.

The questionnaires were administered to the patients individually and were recommended to answer the questions to the best of their abilities. The patient's age, gender, educational status and whether they lived in rural or urban areas was also collected so as to analyze the demographic data using descriptive statistical analysis.

All the significant data was obtained and collected by interviewing the patients with self-prepared, structured questionnaires. One hundred seventy one samples were selected by convenience sampling technique. The survey comprised of fifteen questions that were divided in two sets with a five point scoring scale. The first set of questions was based on patients' knowledge and perception on physician practices and the second set of questions was based on the knowledge and perception of patients on radiological examinations.

Once all the data was collected, the results were then ascertained based on evaluation of the received questionnaire sheets and the scores obtained per individual. The scoring was assessed as follows:

The tool consists of fifteen items divided into two sets, six items in first set and nine items in the second set.

For the first set of questions:

6 x 5 = 30 - Have greater knowledge and perception on radiology and its effects on physician practices.

6 x 1 = 6 - Have lesser knowledge and perception on radiology and its effects on physician practices.

For the second set of questions:

9 x 5 = 40 - Have greater knowledge and perception on radiology and its effects on radiological examinations.

9 x 1 = 9 - Have lesser knowledge and perception on radiology and its effects on radiological examinations.

The scores for any individual would come down between 6 and 30 for the first set of questions. If the score happens to be between 6 and 12 it would mean poor awareness, a score of anywhere between 13 and 23 would mean moderate awareness and a score between 24 and 30 would be suggestive of high awareness.

The scores for any individual would come down between 9 and 40 for the second set of questions. If the score happens to be between 9 and 22 it would mean poor awareness, a score of anywhere between 23 and 35 would mean moderate awareness and a score between 36 and 45 would be suggestive of high awareness.

RESULTS

A study of 171 questionnaires was distributed among patients. The statistical analysis was carried out using SPSS version 16.0. Among 171 study participants 61.99 % had an X-ray done and 38.01% had a CT-scan done (Figure 1). The education status of the participants is given in figure 2.

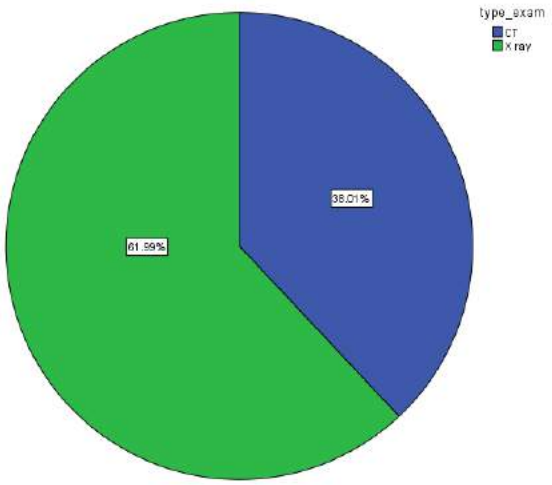

Figure 1: Pie chart showing distribution of participants based on the type of examination.

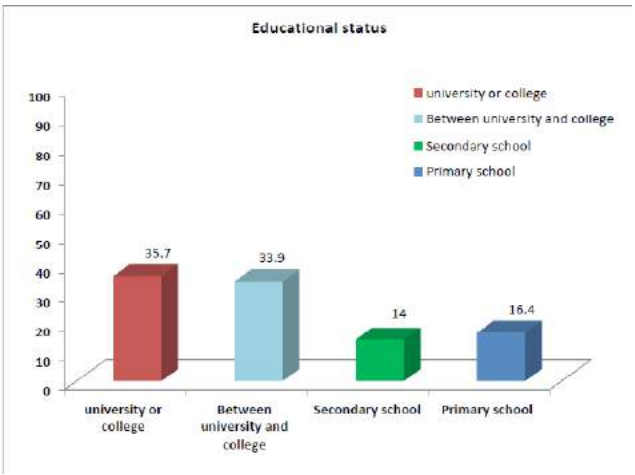

Figure 2: Educational status of the participants.

The awareness of radiological examinations of patients and their educational status in table 1. The respondents who attended university/college show that they have greater awareness than respondents from the latter (35.6%) as compared to the participant who pursued their education in college but didn't enter university. The patients who finished primary and secondary school showed to have lesser awareness comparatively.

Table 1: Awareness on radiological examinations based on educational status

Education		**Awareness**		
Moderate awareness		**High awareness**	**Total**	
	University / college			
		12.9%	22.8%	35.6%
	Intermediate between university and college			
		23.4%	10.5%	33.9%
	Secondary school			
		7.6%	6.4%	14.0%
	primary school			
		8.8%	7.6%	16.4%
Total 52.6%				
		47.4%	100.0%	

The awareness of patients on physician practices based on their educational status is shown in table 2. The result indicates that those patients who had passed university/college had better awareness (39.1%) than the rest. This in turn was followed by patients who had passed college but didn't attend university (33.9%). It is important to note that respondents who attended primary school had poor awareness (4.1%) compared to the rest.

Table 2: Awareness on physician practices based on educational status

Education		**Awareness**			
Low		**Moderate**	**High**	**Total**	
	University				
		3.5%	22.8%	9.4%	39.1%
	Intermediate between university and college				
		2.3%	19.9%	11.7%	33.9%
	Secondary school				
		2.3%	7.0%	4.7%	14.0%
	primary school				
		4.1%	7.0%	5.3%	16.4%
Total 12.3%					
		56.7%	31.0%	100.0%	

DISCUSSION

The overall awareness level of the patients was found to be moderate based on both the domains which had a percentage of 56.7 that was acquired from physician practices and 52.6 from radiological examinations respectively. High awareness on both the domains were comparatively lesser in both the sets of questions with a percentage of 31 on physician practices and 47.3 which was obtained from radiological examinations.

Most of the literatures depict that patients from other parts of the world have low or very poor awareness about radiation and its effects. A study done by Brigitte M. Baumann et al[4] to determine the perception and understanding on radiation and its exposure in CT revealed that the patients had an insufficient understanding of the associated radiation exposure and underestimated the risks of cancer that could be caused by radiation.

Another study done by Michelle L. Ricketts[5] brought to light the poor state of awareness where not only patients, but a number of physicians were uncertain about the radiation that was associated with a number of interventional procedures. The medical students had very basic knowledge on the pertinent amount of radiation used for radiographic studies. Thus, consequential gaps in knowledge on risks and hazards of radiation amidst patients who were ascribed for any radiological examination were inevitable. This highlighted the need for better teaching programs to be incorporated in addition to the existing curriculum. Our study however shows that patients in India are more knowledgeable in this aspect.

A study conducted by Christopher lee et al[6]to ascertain the understanding levels on radiation dose from CT among patients, emergency department physicians and radiologists also determined a drastic drop in patient awareness. The study determined that patients were not informed enough about the dose of radiation, its hazards and the advantages when asked to get a CT scan. Doctors could not give accurate estimations of doses in CT despite their level of experience. This study contradicted to the results obtained within our study where most of the patients accepted the fact that referring doctors did explain about the importance of radiological examination with a percentage of 59. Moreover, most of the patients also admitted that the doctors did explain to them about the benefits (59%) and risks (50.3%) associated with the radiological examination that was referred to them.

A significant relationship can also be observed between demographic data that includes level of education with radiation awareness. A greater education level indirectly implies a substantial amount of familiarity and understanding of radiation. Ali Dehghani et al[7] study insinuated that higher educational level peoples' awareness was significantly higher than lower educational level. The results attained in our study were analogous where education level of the patients ranging from patients who have passed university or college having a moderate awareness of 22.81% on physician practices and 22.81% of moderate awareness on radiological examinations. Whereas those patients who just passed the primary level had a moderate awareness of 7.02% on physician practices and 7.60% on radiological examinations. This indicated that patients with a higher education level had a greater awareness compared to those with a lower educational level.

However, considering that patients in the higher education groups have a good knowledge and perception on the amount of radiation associated with the particular radiological procedure, Doctors and medical professionals should not make assumptions that patients will be aware about their medical examinations due to their educational or social status. As it was formerly proposed by Freudenberg and Beyer et al[8], it is vital that any medical professional should make an effort and approach to educate every patient they consult each time.

Justification happens to be an integral part of educating patients, as any practice involving radiation exposure should be justifiable in order that it yields more benefit to the society than harm. This however happens to be in question as responses pertaining to this aspect happens to be mixed. Ho Kwan Sin et al[9] mentions that there is gross discrepancy between the actual practice and the expectations of patients. This was because most of the respondents expected to be told the reason for the associated risks of the radiological procedure they would be undergoing and the amount of radiation associated. In contrast to the present study conducted, from the frequency of responses of 1-5, 1 having the least responses and 5 having the most, most of patients (25.1%) admitted that their doctors did explain to them the relevance of radiological examinations prescribed to diagnosis of patient specific condition. When it came

to patients being explained about amount of radiation associated, from a frequency of responses of 1-5, most of the patients (25.1%) admitted that their doctors always, and a fair number of patients (24.6%) accepted that they have been informed about the radiation dose associated with the radiological procedure they have been prescribed. Few patients (26.3%) responded that their physicians never gave them information about the relative radiation dose associated. Anxiety of the patient is normally the driving force behind such coercion of their physician. Proper instruction and education of the patient will help in removing anxiety and apprehension within the patient (10).

A significant relationship was observed between 2 questions in the separate sets. Under the set of questions regarding patients' knowledge and perception of physician practices, when asked whether the doctors explained about the importance of the radiological examinations, most of the patients agreed that their physicians had explained about the procedure importance. Whereas, in the second set of questions where the patient was asked whether they understood their doctors explanation about radiation most of the patients agreed that they did in turn understand whatever their doctors explained to them.

Our study does not agree with most of the studies done worldwide in terms of the awareness of radiation, its effects and other related aspects. Our findings were much higher than those obtained in retrospective cohorts. Patients in the South Indian population are well aware of the associated risks of radiation and its effects and its benefits. Majority of them exhibited a moderate awareness from both the sets of questions that were given to them. A percentage of 56.7% was obtained from awareness on physician practices and 52.6% was acquired from awareness of patients on radiological examinations. From patients that were studied, poor awareness was noted only among 12.3% of them. This is contradicting to studies reported worldwide where patients had poor knowledge and perception on radiation and its effects. However, high awareness is desired considering the importance of radiation as a carcinogen rather than just moderate awareness. It is noteworthy that a low awareness should not be mistaken as indicating a complete lack of information regarding any aspect of radiation.

LIMITATIONS OF THE STUDY

The sample size was limited and the study was time bound. The sample population also represented highly educated patients and may not have been representative of the target population therefore having high baseline awareness on radiation.

RECOMMENDATIONS

There is very sporadic study reported among the patients in South India and therefore there is scope for a much elaborate study, throughout the country as a whole.

CONCLUSION

The overall knowledge and perception of radiation and its effect happens to be moderate based on the results. More frequent courses and updates on these topics are recommended in order to keep up with the latest advancements in dose reduction and other protective measures, thereby paving the way for better patient care ultimately.

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Uncovering the Burden of Healthcare Associated Infections (HAIs) in Indian Hospitals: A Review

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ABSTRACT

Healthcare Associated Infection (HAI) prevention and control continues to be a point of concern in terms of safety for both patients and healthcare professionals in the health care field. The true burden of HAI remains unknown, particularly in developing countries. The objective of the review is to provide an overview of HAI burden in Indian hospitals based on the evidences available in the published scientific literature. It also recognizes the inconsistency in the method of surveillance of HAI. A comprehensive search was made on PubMed - Medline, CINAHL, Proquest and Ind Med databases between 2010 and 2017 reporting the prevalence of HAI in India. A total of 47 studies are included in the literature review. Compared to the developed countries the HAI rates in Indian hospitals appears to be high. This could be adding to significantly increased burden on the health system by augmented morbidity and mortality. However, considering the diverse Indian population, further data would be required to assess meticulously the occurrence of various HAIs within different types of hospital settings throughout India.

Keywords: *Healthcare Associated Infections (HAIs); Indian Hospitals; Surveillance.*

INTRODUCTION

Healthcare Associated Infections (HAIs) is a major burden and safety issue for patients inflowing in hospitals of the developing countries. It is considered as one among the leading complication of modern medical therapy supplemented with the advancing age of population, complexity of patients disease conditions, increased use of invasive devices and inappropriate usage of antimicrobials in treatment regimen [1].

On any given day, about one in 25 hospitalized patients has at least one HAI[2]. In the healthcare the most essential HAIs are those related to use of invasive devices: catheter associated urinary tract infection (CAUTI), catheter related blood stream infection (CRBSI), ventilator associated pneumonia (VAP) and surgical site infection (SSI).

The HAIs burden is huge in developed countries, where it affects, 5 -15% of patients in regular wards and 50% or more of patients in ICUs. World Health Organization estimates the Global HAI prevalence between 7 to 12%. The magnitude of the problem in developing countries like India, remains undervalued or even unidentified largely because of complex surveillance activities.

Some developed countries have established surveillance systems. But, in majority of the developing countries it is not the reality because of poor health-care system which are further aggravated by already prevalent economic problems, inadequate resources/ supply of equipment's, understaffing with inadequate infection control practices/policies/guidelines, overcrowding, underreporting and lack of trained professionals. From

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the past many years, it has been acknowledged that HAIs are partially preventable and healthcare can be much safer[1].

Despite HAIs being widely conveyed as the most commonly found complication, there are not adequate evidences of accurate estimate of HAIs in India. The purpose of this review is to explore the burden of HAIs in Indian hospitals by defining the incidence/prevalence of HAIs, as presented in the peer-reviewed scientific literature.

OBJECTIVE

To provide an overview of the burden of HAI in Indian hospitals based on the evidences available in the peer-reviewed scientific literature.

METHOD

Search Strategy and Selection Criteria:

The systematic literature search was made in electronic databases like, MED LINE (Pub Med), CINHAL (Cumulative Index to Nursing and Allied Health Literature), Proquest, Ind Med for published original research articles published between 1st January 2010 and 31st December 2017.

The search terms used to identify articles from MEDLINE and CINAHL, are "epidemiology" OR "prevalence" OR "Surveillance" OR "incidence" OR "Frequency" OR "Rate" OR "Percentage" OR "Proportion" OR "Extent" OR "Statistics" OR "Number" in combination with "cross infection" OR "Healthcare associated infection" OR "infection" OR "Nosocomial infection" OR "HAI".

To limit the publications from Indian hospitals, the search term used are "hospitals" OR Hospital OR "delivery of health care" OR "Health care" was used with South Asia OR "India" OR "North India" OR "South India" OR "West India" OR "East India". These Mesh terms were applied using an all text search.

Eligibility criteria:

Inclusion criteria

Cross sectional, cohort, case control, observational, randomised controlled trial, case reports published in peer-reviewed English-language journals

Only studies undertaken in Indian hospital(s)

If a study is international and multi-centred, then data from the Indian hospitals are included.

Exclusion criteria:

Grey literatures

Non-peer reviewed literatures

Conference abstracts or policy statements

RESULTS

Selection of literatures:

On preliminary search total 1950 articles were identified. After duplicate articles were removed and title screening was done for 1938 articles. Total 264 abstracts were reviewed and among which 54 articles were considered appropriate for the full text review. Among them, 47 articles are included in the review as they met the eligibility criteria.

General study characteristics:

Overall, all the studies were hospital based and were primarily prevalence/ incidence surveys, which were carried out in specific areas like medical / surgical wards or ICUs or to particular population as well as for particular procedures.

There were 3 multicenter study, giving the cumulative infection rate. Majority of the studies were done at single tertiary care hospitals. Six of the study were retrospective study. Data collection period of the studies varied from 6 months to 6 years. Majority of the studies used US CDC/ NHSN surveillance definition of HAI and 4 studies have used, Clinical pulmonary infection score (CPIS) for diagnosing VAP.

Uniformity in reporting of infection rates were not maintained. Majority of studies have reported HAIs mainly as infections per 100 patients. Some studies reported specific infection per 100 patients, whereas device associated infection have reported rate of infection per 1000 device days.

HAI prevalence/ Crude infection rates:

There are considerable variation in infection rates in studies done at different centers across the country. The prevalence of HAI varied based on the study setting, the

type of hospital, location of surveillance (ICU or general ward), the type of patient/ population and the definition of HAI and its surveillance techniques. Hospital-wide HAI prevalence in the present review varied between 3.76% and 50.2%[3,4]. Overall HAI rates were not described in many studies. However the prevalence or incidence based on the type of HAI is explained. The reason for the greater infection rate may be the higher number of visitors, length of ICU stay, improper antimicrobial therapy, device usage, lack of knowledge, improper monitoring and structure of the hospital[5].

Nevertheless crude infection rate may not be demonstrative of the overall burden of the HAIs because they don't consider the risk factors in patients to develop infection or risks associated with exposure to medical therapy. At the same time the differences in literature findings are not certainly related to superior quality care, as there are many other factors may be responsible including differences in criteria's used for patient selection, mixing of the patients, type of ICUs, length of stay in hospital, extent of device utilization, resources available and criteria for discharge[6].

Catheter Associated Urinary Tract Infections (CAUTI):

Prevalence of CAUTI was reported by 21 studies. Prevalence of CAUTI ranged from 0.6 per 1000 device days to 42 (53.43%) [9,13].

CAUTI is a serious cause of morbidity and mortality in ICU patients. Duration of indwelling catheters in place is strongly associated with the risk of acquiring infection i.e., the longer the duration of catheter is in place, higher is the incidence of CAUTI. The daily rate of acquiring bacteriuria is approximately 3 to 10%[14]. There was a co-relation between duration of catheterization and increased incidence of CAUTI. The incidence of CAUTI was found 6.54% with more than 8 catheter days, 75% incidence with 15-21 catheter days almost 100% with >22 catheter days[15].

Catheter related blood stream infection (CRBSI):

Central line insertion, is a prevailing invasive procedure performed in critical care areas and are linked with local colonization of infectious organisms ultimately leading to bacteremia and sepsis. The more frequently reported reason for CLABSI is the use of central venous catheters among critically ill patients. In the present review CRBSI and BSI related data were reported in 22 studies. The infection rate ranged from 0.45% in Primary BSI - 47.6%, Secondary BSI - 52.3%. A number of reasons for CRBSI include type of patient setting, insertion technique, catheter lumens, cannulation site, duration of catheterization, frequency of manipulation, type of antiseptic solution used, experience and skill of the person handling, antibiotic use and immune status of the patient[18]. CLABSI rates in ICUs of developing countries like India are 3-5 times greater than the developed world[19].

Table 1: Rate of CAUTI & CRBSI

Author	Location	Infection Rate
CAUTI		
Sarita Yadav et al[16]	Haryana	8.73/1000 device days
Devendra K. et al[15]	Gwalior	13.14/ 1000 catheter days
Indranil Bagchi et al[14]	Nagpur, Maharashtra	29.09%
Namita Jaggi et al[17]	NR	7.93 %
CRBSI		
Purva Mathur et al[9]	New Delhi.	Primary BSI - 47.6% Secondary BSI - 52.3%
Namita Jaggi et al[17]	Multi center	6.4/1000 CL-days (baseline) & 3.9/1000 CL-days (second year)

Cont... **Table 1: Rate of CAUTI & CRBSI**

Deepti et al[7]	New Delhi	/ 1000 CVC days
Ramanathan et al[18]	NR	8.75 /1000 catheter days
K Chopdekar et al[11]	Mumbai	9.26/1000 catheter days
S.B.Misra et al[19]	Northern India	17.04/1000 catheter-days

Surgical-site infections (SSIs):

The rate of SSI also varies more widely based on the types of surgical procedures, circumstances at which procedure was performed, suggesting it to be an important determinant. In the present review SSI rate varied from 1.6% to 17.8%[2,10].

SSIs were identified as the most common HAI (23.94%), followed by hospital-acquired pneumonia (18.31%), UTI (16.9%), CRBSI (16.9%), VAP (9.85%), septicemia (8.45%). These infections were reported highest in surgical ICU (25%), followed by medical ICU (20%) and burns ward (20%)[3]. Wound infections (44.44%) were the most frequent HAI found, followed by urinary tract infections (31.31%) and respiratory tract infections (9%) with the more bacterial load in burn ward (51.51%). There is a need for antimicrobial stewardship in preventing in HAI[8].

Ventilator Associated Infection (VAP):

Literature review, revealed VAP, ranged from 4.12 per 1000 ventilator-days to 72.56% per 1000 device days[19,4]. Among the common infections reported VAP (81%) is the most common infection, followed by CA-UTI (17.2%) and CR-BSI (1.7%)[4]. This was comparable with a study where VAP (50%) followed by CRBSI (27.77%), and CAUTI (22.22%) was seen. The chance of acquiring VAP is reported as 3% per day during the first week, 2% per day during the second week and 1% per day in the ensuing weeks of mechanical ventilation[4].

Mortality and morbidity analysis:

Often HAIs are related with substantial mortality and morbidities. The likelihoods of acquiring an HAI were 3.11, 3.85 and 5.24 times more when the duration of hospital stay exceeded 15, 22-30 or more than 30 days respectively[3]. The maximum number of deaths was due to BSI contributing to case fatality rate (27.22%) and proportional mortality rate (60.12 %)[11].

HAI contributed to death in 42 (24.1%) patients as compared to 28 patients (16.2%), without acquiring HAIs[4]. The crude mortality rate was 34.5% in trauma patients having BSI. Among these, 40 (36%) episodes were primary BSIs and 72 (64%) were secondary BSIs. Among them 75% patients, died because of septicemia[9]. Mortality among VAP patients was found to be 50%[40]. The attributable mortality of CRBSI are at the range of 10% - 25%. It mandates for regular surveillance being done at the critical care areas[11].

Unfortunately, very limited mortality and morbidity related data of HAI are existing from Indian hospitals. Sustained surveillance of HAI is essential to guide appropriate therapy to overcome the threat of infections. It is imperative that all health care professionals must take key role in controlling and preventing HAI.

DISCUSSION

HAIs are seen worldwide but are less studied and are given less emphasis in developing countries. Patients in hospitals especially, critically ill patients in ICUs, are at greater risk of developing HAI. It is difficult to ignore the burden posed by HAIs on patients' safety in terms of sufferings, pain, antibiotic resistance, delayed recovery, prolonged hospital stay, increased number of re-admission, mortality, morbidity and excess healthcare costs.

This review has highlighted a myriad of different HAIs in Indian healthcare. In many instances, the data shown in the literature was limited. Hence, making comparisons or extrapolation of data was not possible.

The review revealed an extremely fragmented information on the burden of HAI in India. With less number of studies, varying way of presenting infection rates and lack of existing national surveillance systems, makes it difficult to estimate the burden of HAI in the country. Furthermore majority of these studies were

done at single hospital which cannot be considered representative of HAI in the country. In particular majority of these studies were conducted in private or corporate hospitals, which represent a specific type of setting and not the broad range of healthcare settings in India. Hence it is difficult to reflect the actual scenario.

The threat posed by HAI and its associated complications within healthcare settings and to the community is alarming. If, the reporting of HAIs from hospitals in India are made mandatory, it would help to tackle the problem and take any corrective action. Ultimately this brings the quality and enable patient empowerment in Indian health care.

Quite a lot of studies have shown that routine surveillance of HAI can reduce the burden of HAI. However, in developing countries, due to lack of formal surveillance the rate of HAI is high. Surveillance of HAI is an imperative prerequisite for quality care and prevention of infections.

CONCLUSION

Healthcare today is becoming more and more complex with emerging challenges and the changing healthcare environment. The change in trend of bacterial infection and their antimicrobial susceptibility patterns strongly indicate toward a need for implementing robust infection control policies and active surveillance. Health professional must focus on practices known to reduce the HAI. Researches must be invested towards finding innovative solutions to combat challenges, such as antimicrobial resistance, the increasing burden of HAIs, and the refinement of existing intervention bundles to be the safest and most cost-effective way.

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Source of Funding: Self

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Women Empowerment through Step Programme of Government with Special Reference to Kanpur (Uttar Pradesh)

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ABSTRACT

Purpose-The aim of this paper is to identify the factors of women empowerment and to know how STEP policy contributes in women empowerment.

Methodology/Staistical Analysis -. Regression analysis is used for this research paper

and the research use four independent variable**(economic participation, economic opportunity, cultural and social issue, future status quo**) and one dependent variable (**Women empowerment**) is to analyze whether the STEP policy is beneficial for women empowerment or not.

Findings-The findings of the study shows that there is a positive and significant relationship among the independent variable(economic participation, economic opportunity, cultural and social issue, future status quo) and dependent variable (Women empowerment).

Practical implication- To aware the government regarding proper implementation of STEP policy and aware to people regarding STEP policy.

Research limitations- Respondents level was not up to the mark they find it hard to respond to the questionnaire. The busy schedule of the respondents was a major limitation for the study.

Keywords- *Women Empowerment, Government Policies, STEP scheme, Economic Participation, Economic Opportunity, Cultural and Social issue, Future Status Quo.*

INTRODUCTION

"There is no chance for welfare of the world unless the condition of women is enhanced .it is not possible for a bird to fly on only one wing"

Swami Vivekanand

International Women's Day was celebrated on 8th March. This year the UN COMMISSION theme was " Time is now: rural and urban activists transforming women's lives" Women empowerment as a approach was discussed at the UNITED NATION'S third world war meeting on female in Nairobi in 1985 which defined it as " **A reallocation of social and economic freedom and control of resources in favor of women'**'. Women empowerment has now become an international issue and gender inequality is the problem against women .The Government of India announced 2001 as the year of Women's Empowerment "swashakti". Narendra Modi had mentioned the importance of Women Empowerment as **"Economic power is very important for women empowerment they must participate in economic development and I have seen that women are very good at adapting latest technology, we should link**

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women and technology up gradation" As this study is based on women empowerment through government policy and its effectiveness this research paper considering one central government policy that is STEP .

Support to Training and Employment Program for women (STEP) Ministry of Women and Child Development of India: The Program is a 100% Central Sector program is under implementation since 1986-87. Government of India has set an enthusiastic target of training 500 million individuals by 2022 which translates to training 42 million a year for this objective. India's vocational training infrastructure needs to be widened to meet the diverse and many skill requirements of the Industry. There has been recent concern about the decrease in women's workforce participation in India. Concurrently, women have become more inspirational and are ready to participate equally to the economy .It is a program designed for skill training of women which has been remake during Eleventh plan based on evaluation results and integrated with Swayamsiddha to ensure adequate expenditure for countrywide implementation. The Rashtriya MahilaKosh has been integrated with STEP and Swayamsiddha for credit linkages. STEP Program has been introduced to address occupational inspiration of poor women who do not have the opportunity of formal proficiency training. This program concentrate on proficiency Development for self or wage employment because proficiency and knowledge are the active force of economic growth and social development of a country[2].

The objectives of this scheme are as below:

- To develop skills that provide Employment to women.
- To develop expertise and proficiency that capacitate women to become entrepreneurs.
- To upgrade the proficiency of poor and marginalized women.
- To provide employment to them on a continuous basis.

Beneficiaries : All women candidates who are in the age group of 16 and above are eligible.

Benefits: Under this program assistance is given to the following sector i.e Farming,Horticulture, Food Processing, Handloom, Tailoring,Stitching,Embroidery,Zari,etc Handicraft, Computer &IT Implemented Services along with soft skill English, Gemsand Jewelry, Travel, Tourism and Hospitality[1]. For Conveying Skill related to employability and entrepreneurship, Provision for Support Services (Health, Childcare, Education, and Sanitationetc.), access to Credit and Imparting Nutrition Education. According to WOMEN AND CHILD DEVELOPMENT UTTAR PRADESH annual report (2017-18) department has released fund for STEP programRs.156.31 lakhs and beneficiaries covered are 2850 in UP till March 2017[3].

OBJECTIVE OF STUDY

1. To evaluate the significant relationship between STEP program and economic status of women.
2. To examine the relative effect of each independent variables on STEP program

Hypothesis of the study:

1. There is no significance relation between STEP policy and economic status of women.
2. There is no significance between empowerment program and social status of women**.**

THEORITICAL FRAMEWORK MODEL

Research methodology: This study is conducted in NGOs which are located in Kanpur area of UP**.** The data was collected in month of March. Women needs to be empowered by which country will be developed.

Sampling: The sampling techniques used for this study is purposive sampling.

Nature of variable: variables have direct impact on women empowerment. Respondents have given their response in five point Likert scale ranging from strongly disagree to strongly agree.

Collection of Data: 210 questionnaire was distributed and we got back only 200 filled questionnaire from the respondents.

REVIEW OF LITERATURE

Women empowerment :

The women empowerment is defined as ''the method , and the result of the method, by which women acquired larger control over material and psychological

resources, and challenge the culture of society and the gender-based differences against women in all the institutions and structures of society' [4].The circumstances and consequences of preferences are reflections on the appraisal of women's empowerment. It reveals that the most probable indicators for empowerment of women are: family size and structure, married benefits , financial independency ,freedom of mobility and lifelong expertise of employment participation in the modern.[5] she sees empowerment as relative to one's own previous competencies. She identifies empowerment of women in 3 spheres the individual empowerment, collective or group empowerment and empowerment in close relationship [6] It is concluded that women empowerment is process oriented, holistic in nature and it deals with strategic rather than practical gender interest[7].

Economic opportunity:

Women empowerment has positive relationship to women's career choice and having a bank account which provides monetary security to women as they feel a lot authoritative and can contribute economically to their families[8] The researcher identifies that the economic opportunity and economic participation has directly related to the increase in women income and promote her status in the society(women empowerment)[9] The poverty and lack of opportunity increases the difference between men and women. So economic opportunity is positively related to the women empowerment and women status in society.[10]

3. Economic Participation

The labor force participation of the women is the strongest factor than education and household decision making. These have a positive impact on Women Empowerment in South East Asian countries[11]. The women contribution in economic activities is inversely related with marriage status, primary education, number of kids and female head of households in Pakistan [12]. The Women's wage rate and education are positively related with labor force participation rate. The labor force participation rate is inversely related with marriage status, the number of kids and age in Kuwait [13]

4. Cultural and Social issues

The culture of the respondent is measured through respondent's education and level of exposure of women to media are two important positive granting indicators in every region in India increasing women empowerment level with respect to independent decision making role[14]. The research has been found that Women's ages and education level have raised the two highly important indicators for crushing domestic Violence [15].The research shows that women are not getting permission to participate in politics and decision making that can positively affect their life and family in Nigeria[16].

5. Future status quo

India's national income would increase by 27 % if the participation of women is equal to the level of men[17]. The country economic growth is positively effected by women working age in formal employment [18]. The research says that there is a positive correlation between women empowerment and GDP[19].

RESULTS

Multiple regression analysis is used for this research and this method will explain the relationship between dependent (women empowerment) and independent variable (economic participation, economic opportunity) R Square value used to regulate the variation on dependent variable towards the independent variable.

Table No. 1: Reliability Statistics

(Common attributes of women empowerment)

INDICATORS	CRONBACH'SALPHA
Economic participation	0.761
Economic opportunity	0.620
Cultural and social issue	0.710
Future status quo	0.763
Women empowerment	0.739

INTERPRETATION: The cronbach's alpha was executed here for statistical evaluation of reliability of the responses. Table (NO 1.) is showing the information

TABLE NO.2: MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.867[a]	.751	.746	.55792	.751	147.221	4	195	.000

a. Predictors: (Constant), FSQ, EO, EP, CS

b. Dependent Variable: WE

TABLE NO 3: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	183.302	4	45.826	147.221	.000[a]
	Residual	60.698	195	.311		
	Total	244.000	199			

This model summary shows the value of R for the model that has been derived for the data, R has the value of 0.867 % indicators have been added are **(**Economic participation ,Economic opportunity Cultural and social issue Future status quo) between outcome (Women empowerment) therefore R value = 0.867% is good model fit. As per next column a value of R^2(0.751) is achieved and the value is a measure of how much of the variability in the outcome is accounted by the indicators . The adjusted R^2 (0.746 %) gives us some pictures of how well our model generalizes and ideally, we would like its value to be the same as ,or very close to the value of R^2 in fact the difference between the value is (0.751 -0.746 = .005 %) .

DISCUSSION

The findings of the study shows that there is a positive and significant relationship among the independent variables and dependent variable .The null Hypothesis is rejected because analysis shows that all the independent indicators has**(**Economic participation, Economic opportunity Cultural and social issue Future status quo) positively related to the women empowerment.

CONCLUSION

This research concludes that UP government has implemented STEP policy in Kanpur area. By the above analysis this research reveals that economic opportunity is positively related to women empowerment that means if opportunity for women is increased, women will get employed and become empowered. Economic participation is positively related to women empowerment and if women are doing job or entrepreneur so that they participate in economic activity directly or indirectly which may help in empowering women. Social and Cultural issues positively impact the women empowerment if society and cultural norm support to women so women status will also be improve in society and women become empowered and future quo is also positively related to women empowerment that means if women are self-employed and participate in economy so they directly or indirectly participate in the development of country economy. The government STEP scheme is implemented in Kanpur area and it had helped to improve economic and social status of women and when the economic and social status of women improves women are empowered automatically**.**

Ethical Clearance: Nil

Source of Funding: Self

Conflict of Interest: Nil

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A Mixed Method Study on Utilization of Maternal Health Services and Barriers among Women of Reproductive Age in Gujarat State- Pilot Study

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ABSTRACT

Background: It is necessary for the policy makers to understand factors influencing utilization of services provided to mothers. This will help them to formulate interventions which can improve utilization. So present study was conducted to determine utilization and barriers of utilization of services provided to mothers in rural areas of Anand district in Gujarat state.

Method: A sequential explanatory study was conducted in eight villages of Anand district from March 2018 to May 2018. Total 48 women of reproductive age were recruited through multistage sampling to assess utilization of services provided for maternal health through structured questionnaire. Reproductive age women (18-45 years), medical officers, female health worker and ASHAs were selected through purposive sampling for indepth interviews and focus group discussion to explore barriers of utilization of maternal health services.

Results: 100% participants utilized antenatal visits at least once, 97.91% participants utilized intranatal services and 97.91% participants received visit by health care professionals. However mother's health literacy, economical issues, influence of socio cultural believes and practices, response of health care provider, access and resource availability, physical response, gender bias, negligence and ignorance were perceived barriers of not utilization of various aspects of maternal health services.

Conclusion: The study revealed that women had positive response towards utilization of services but it is a need of awareness programme for women on content and utilization of services.

Keywords: *maternal health services, women of reproductive age, ASHA*

INTRODUCTION

Child bearing period believed to be very blessed period since past in India. But it also conceal implicit threats to women's health.[1,2]

World Bank, UNICEF and WHO estimated more than 3.5 lakh maternal death per year across the world. 99% estimated maternal mortality present in developing countries and death is more common in women belongs to rural parts and underprivileged families.[3,4]

Improvement of maternal health was one of the goals for development in the Millennium Declaration (MDG 5) and Health for All by 2000 AD.[5,6] Further, one of objectives of global strategy for Women's, Children's and Adolescents' Health, 2016-2030 was to decrease maternal mortality lesser that 70 per 100000 live births across the world.[7]

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Though India is very first country to start maternal health program, it has high maternal mortality (167 per 100000 live births in 2011-2013) with law utilization of maternal health services. India accounts for an approximate 44000 maternal death.[6,8] Pregnancy associated mortality and morbidity have major impression on Indian women's life, their families and newly born child.[8] In spite of international progress in decreasing maternal mortality, prompt measures are required to fulfill the SDG 2030 target to abolish preventable maternal mortality.[9]

Gujarat is one of the prosperous, urbanized, industrialized and fastest growing states of India but MMR of Gujarat was 112 during the year 2011-13.[10] So the present study was conducted to determine the utilization and barriers of utilization of maternal health services in Anand district with assumption that the result of the study will improve policy maker's understanding and serves as important tool for any possible interventions aimed to improve the low usage of services related to maternal care in Gujarat.

Objectives:

1. To determine the utilization of maternal health services among women of reproductive age in selected rural areas of Anand district.
2. To explore the perception of rural women about barriers of utilization of maternal health services.
3. To explore perception regarding barriers of utilization of maternal health services from health care providers like doctors, nurses, ASHA, family members.

MATERIAL AND METHOD

Study design and setting:

The research adopted a mixed method approach with sequential explanatory design. The design consisted of three phases. In phase-1 quantitative data were collected from women of reproductive age and analyzed. In phase-2, the result of quantitative data was used to build qualitative data collection tool and to select participants. Also the qualitative data were collected and analyzed in phase-2. In phase-3 finding obtained from all methods were drawn together and overall results identified.

Setting and sampling:

For phase-1 multi stage sampling was used to select participants.

1st stage: Anand district was selected (with convenience) from central region of Gujarat state.

2nd stage: Anand district is consists of 8 taluka. The rural area of that taluka was listed and with simple random sampling one village was selected from each taluka.

3rd stage: From each village prior list of women who met the inclusion and exclusion criteria was prepared with the help of Medical Officer, Female health worker and ASHA. 6 women from each village and total 48 women of reproductive age were selected with simple random sampling to determine utilization of services provided for maternal health.

For phase-2, total 8 women who had poor utilization of services were selected for in depth interview with purposive sampling to explore barriers of utilization of maternal health services. CHC, PHC or sub centre present in the selected women's areas were included to interview of its health care professionals like 5 Medical officer, and 7 female health workers to explore barriers of utilization of services related to maternal health. Total 12 ASHAs were selected for focus group discussion.

Data collection:

Data were collected from March 2018 to May 2018. In phase-1 data was collected through structured questionnaire during a personal interview conducted in Gujarati language. The questionnaire made up of socio-demographical features, obstetric profile and utilization of maternal health services. Utilization of services covered antenatal services, intranatal services and postnatal services.

In phase-2 in depth interviews were conducted with women who had poor utilization with semi structured interview guide to explore barriers. Total 8 interviews with women of reproductive age, 5 with medical officer, 7 with FHW and 2 focus group interviews with ASHAs were conducted which was lasted for 30-45 minutes. All discussions were audio recorded and field notes were also taken. Then responses were transcribed verbatim into English and reviewed to ensure accuracy. The

transcripts were analyzed using the inductive content analysis approach and the responses were triangulated.

FINDINGS

Phase-1:

Demographic and obstetrical data of participants:

39.58% participants were belonged 18-22 years, 31.25% from 23-27 years, 22.91% from 28-32 years and 6.25% had more than 33 years age. 25% participants did not receive formal education, 47.91% received primary, 16.66% received secondary and 10.41% received higher secondary education. 87.5% participants were unemployed, 10.41% were unskilled and 2.08% were semiskilled employee. 68.75% participants had monthly family income ≤5000, 29.16% had 5001-10000 and 2.08% had 10001-15000. 39.58% participants had 1 child, 25%, 22.91% and 12.5% had 2,3 and more than 3 children respectively.

Table-1: Utilization of services related to maternal health:

Sr. No.	Utilization of services related to maternal health	Frequency N=48	Percentage
I	Antenatal services		
	Utilization of antenatal visit	48	100%
	First visit: till 16 weeks of pregnancy	40	83.33%
	Second visit period: 20-24 weeks of pregnancy	41	85.41%
	Third visit period: 28-32 weeks of pregnancy	35	72.91%
	Forth visit period: 36 to 40 weeks of pregnancy	31	64.58%
	Measurement of height and weight during each visit.	47	97.91%
	Measurement of blood pressure during each visit.	45	93.75%
	Utilization of blood test services.	48	100%
	Utilization of urine test services.	47	97.91%
	Abdominal examination.	26	54.16%
	Received two doses of tetanus toxoid vaccination	46	95.83%
	Used minimum 100 tablets of iron folic acid or syrup	37	77%
	Counselling for personal hygiene.	47	97.91%
	Counselling for nutrition.	47	97.91%
	Counselling for rest during pregnancy.	45	93.75%
	Counselling for danger signs of pregnancy.	46	95.83%
II	Intranatal services		
	Institutional delivery	47	97.91%
	If yes	47	97.91%
	Safe delivery assisted by skilled birth attender.	47	97.91%
	Free diet during hospital stay.	47	97.91%
	Exemption from all kinds of user charges.	46	95.83%
	Free transportation facility provided by health care institute.	47	97.91%
III	**Postnatal services**		
	Postnatal visit by health care provider	47	97.91%
	Detail		
	2nd visit: On 3rd postnatal day	47	97.91%
	3rd visit: On 7th postnatal day	47	97.91%
	4th visit: After 6 weeks of delivery	35	72.91%

Cont... **Table-1: Utilization of services related to maternal health:**

	If yes		
	Counselling for danger signs in postnatal.	37	77.08%
	Counselling for breast feeding.	40	83.33%
	Counselling for immunization of baby.	37	77%
	Counselling for family planning methods.	35	72.91%

Phase-2:

Analysis revealed following themes of barriers to utilize maternal health care services in rural areas.

Mother's health literacy:

Illiteracy, lack of knowledge about pregnancy and postnatal visit, unawareness about body changes were perceived barriers of utilization of services related to maternal health. As one of the participant said that *" I am illiterate and I don't know date, my menstruation was missed and I thought I had 3 months but when we went for sonography in first visit I came to know that I had 5 month."(Women of reproductive age-5, 30 years old).*

"Many women did not remember the date of their last menstrual period, we need to give them clues about any festivals or important days."(ASHA-2, 9)

Economical issues:

Though all maternal health services are not charged under JSSK scheme, extra payments like journey cost during antenatal visits, leaving work for the antenatal visits, paying for investigation, and giving money to hospital staff after delivery were reported as barriers for utilization of services related to maternal health. Even APL holders did not receive financial assistance from government.

"The delivery was free of cost but Traditional birth attender asked Rs. 200 and class IV worker asked Rs. 100 and we paid to them. We had to pay." (Women of reproductive age-6, 28 years old)

Influence of socio cultural believes and practices:

Social responsibilities of women like taking care of child, taking care of house, preparing food for family and working in the farms were responsible for not arrive at health facilities during the regular time of service delivery.

"Many women were so busy with home responsibilities that they could not come for regular antenatal visits and vaccination and they did not have time for themselves." (ASHA-4)

Cultural believes and practices:

Some women and their family members did not visit hospital during antenatal period because of religious believes. Women also followed food taboos.

"I had vegetable and my daughter got sick so I stopped eating that vegetables." (Women of reproductive age-3, 28 years old)

Traditional believes:

Tradition to delivered babies at home was also a barrier.

"Madam, the Dayan was very trustable and all old female of my family delivered at home. And both mother and babies were healthy."(Female decision maker of family-2, 50 years old)

Social power:

Cultural believes and practices passed by parents in laws and relatives acted as barriers of not utilizing counselling services.

"I did not know the reason but I ate whatever was given to me in postnatal period." (Women of reproductive age-6, 28 years old)

Response of health care provider:

Absences of medical officer, bed smell in hospital, long waiting time, were reported as perceived barriers of not utilization or living of the maternal health services.

"I have charge of two PHC so I am not available in either of PHC for few days."(Medical officer-2)

Access and resource availability

Far distance of PHC, not availability of emergency services at night time, longer waiting time in hospital to get institutional transportation were perceived barriers of not accessing the maternal health services.

"ASHA said that no emergency transportation available at night so we took private auto and went to hospital."(Women of reproductive age-5, 30 years old)

Physical response of body:

Constipation, nausea, vomiting, and diarrhoea and bed taste of iron folic acid tablets were reported as perceived barriers of not consuming iron folic tables.

"I had constipation so I did not take medicine" (Women of reproductive age-6, 28 years old)

Gender bias:

Wish to have male child was perceived barrier of utilization of services.

"Even for male child they go for 6-7 para sometimes."(Medical officer-1)

Negligence and ignorance:

Negligence and ignorance identified as perceived barrier for utilization of postnatal services.

Phase-3:

Interpretation and integration of results of phase-1 and phase-2:

Utilization of antenatal services:

The study revealed that 100% participants had visited health care facilities at least once in throughout pregnancy and majority of them utilized services of bold test, urine test, height and weight measurement and blood pressure monitoring. But illiteracy, lack of knowledge about pregnancy, travel cost, wedges lost during antenatal visits, social responsibilities, trust on religious leaders, absence of medical officers at health care institute and long waiting time were perceived barriers of late registration and irregular utilization of services.

Only 26 participants utilized service of abdominal examination although fees for sonography and not provided this service by female health worker were reported as barrier to abdominal examination service.

Total 37 participants consumed more than 100 iron folic acid tablets while rest of the participants did not consumed due to nausea, vomiting, constipation, black colour stool and ignorance.

Average 45 participants utilized services of counselling and it is not utilize by other participants due to food taboos and restrictions from parents inlaws and relatives.

Utilization of intranatal services:

97.91% participants utilized services of institutional delivery assisted by skilled birth attender but tradition to deliver baby at home and trust on traditional Dai were perceived barriers of not to go for institutional delivery.

47 participants utilized free transportation provided by hospital and rest of participants did not utilized because of long waiting time to get it.

Utilization of postnatal services:

Total 47 participants were visited by ASHA and Female health worker during 2nd and 3rd postnatal day. But only 35 participants were visited by ASHA after 6th week of delivery. However lack of knowledge about postnatal visit, negligence and busy schedule of female health workers identified as barriers of utilization of postnatal visits.

Average 38 participants utilized services of counselling during postnatal period while food taboos, and restrictions from parents inlaws were identical barriers of utilization counselling services. Further gender bias was barrier of not utilization of family planning counselling.

CONCLUSION

Women of reproductive age had very positive response towards utilization of services related to maternal health. However perceived barriers of utilization of services were included mother's health literacy, economical issues, influence of socio cultural believes and practices, response of health care provider, access and resource availability, physical response, gender bias, negligence and ignorance

Limitations: This study relied on self reported quantitative data so there is a chance of recall bias.

Further, the findings cannot be concluded for entire district or state and may not be relevant for urban areas. In addition, questions on the utilization of services were attentive to most recent pregnancy in one year before data collection, so it was difficult to investigate behavioral pattern to use these services for subsequent births from women and therefore establishment of causal relationship is difficult.

Conflict of Interest: No conflict of interest

Source of Funding: None

Ethical Clearance: Ethical clearance was obtained by Institutional Ethics Committee for Human Research, CHARUSAT. Informed written consent was obtained from participnats and if participants unable to read or write, the consent was explained and thumb impression was taken in the presence of one witness.

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A Study on Stress and its Effect on Private School Teachers

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ABSTRACT

The main aim of this study is to find the factors causing stress to the Private school teachers and the effects on coping strategies to reduce stress. The researcher used regression analysis to find the result. The findings shows that the main factors of stress are low pay and work load. It concludes that the coping strategies followed by the Management reduce stress to the school teachers.

Keywords: *Stress Management, Coping Strategies.*

INTRODUCTION

Stress management can be defined as a set of techniques to help people deal more effectively with stress in their life by observing the specific stressors and taking positive actions to minimize their effects (Raitano & Klener, 2004).]. Stress basically involves the relationships between individuals and their environment that are considered as challenging or exceeding their resources Stress is acknowledged to be one of the main causes of absence from work. Anxiety, frustration, anger and feelings of inadequacy, helplessness or powerlessness are emotions often associated with stress. If these challenges are presented by a teachers, then this will be effected on their teaching and this would be difficult to cope with that profession.

One of the most important sources of stress in each person's life is employment. Occupational stress has become a common and main problem in workplaces. It is one of the main reasons for reduced the performance of employees. To achieve quality, efficiency, effectiveness, and equity in their work place, certain conditions must be appropriate and accompanied by the reduction of stress in employees. There are many stressful things in the work environment of Private school teachers, the most important of which are the shortage of teachers, many substitute classes and low salary.

Stress management is a wide spectrum of techniques and psychotherapies aimed at controlling a person›s level ofstress, especially chronic stress, usually for the purpose of improving everyday functioning.

The importance given to stress management skills in workplace can be guessed from the fact that employers, in many countries, have been burdened with a legal responsibility of recognizing as well as coping with the workplace stress in order to ensure good mental and physical health of employees in organization.

Most cure professions including nursing, medicine and other human services ones are considered stressful. Teaching is also particular in view of the responsibility to health, bliss and activities of the students. Teachers are responsible for promotion of knowledge, pedagogy of students and creating discipline so, teachers, stress is of different type.

Reducing stress in your everyday life is vital for maintaining your overall health, as it can improve your mood, boost immune function, promote longevity and allow you to be more productive.Stress has such a powerful impact on your well being because it is a natural response that is activated in the brain.

In this study, the researcher finds the factors causing of stress to school teachers, the coping strategies which

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is followed by the Management to reduce stress and the strategies which are needed to reduce stress more.

REVIEW OF LITERATURE

Nor Diyana Mohammed Shobri et al(2013) The Influence of Stress Management Techniques on Employees' Retention: A Study on Call Center Agents in Malaysia. DOI: 10.7763/IPEDR. 2013. V64. 5. Stress management techniques can help employees to deal effectively with stress in their work life by identifying the specific stressors and taking positive actions to minimize their effects. The techniques that are suitable to prevent stress at the workplace include time management, relaxation and physical exercise. Thus, this study identifies the best stress management technique and its influence on employees' retention among Malaysian call center agents. The finding indicated that relaxation is the best technique in maintaining employees' retention. This article ends with the suggestion for the organization to implement various programs to maintain the well-being of employees[3].

Prerana.R.Huli.(2014) Stress Management in Adolescence. Quest Journals Journal of Research in Humanities and Social Science Volume 2 ~ Issue 7 (2014) pp: 50-57. - This is an extensive Review of Literature Study on Stress Management in Adolescents. One of the important trends which are being observed is getting instant gratification from the electronic media and gadgets. The involvement of adolescents in getting instant gratification of needs has led to lot of stress in them and in their relationships with family and peers. Stress leads to maladaptive behavior as mentioned above[4].

Ioanna V. Papathanasiou et al. (2015) Stress: Concepts, theoretical models and nursing interventions. American Journal of Nursing Science 2015; 4(2-1): 45-50. : Stress is a fact of everyday life and it can be defined either as a reaction or as a stimulus. Propose of this study is to present the basic concepts and the main theoretical models of stress, its effects on the individual, the coping strategies and the nursing methods of addressing it. The main theoretical approaches for stress are interpreting it differently, either as a stimulus, as a response or as a transaction. Nurses, after the recognition of patients' needs and reactions, should choose those interventions that will be the most effective for each particular patient. Most important interventions for alleviating stress are: anxiety reduction, anger management, relaxation and sleep, proper diet, physical exercise, relaxation techniques and effective time management[2].

Godwin et al.(2016)Occupational Stress and its Management among Nurses. Health Science Journal ISSN 1791-809X Vol.10 No.6:467. A purposive sampling technique and a self-administered questionnaire were used to select 73 nurses from the nursing and midwifery department in the Hospital. Descriptive and inferential statistics were used to analyze the data. The study found out that the major causes of stress identified by the nurses were inadequate motivation (98.6%), inadequate staffing levels (91.8%), handling a large number of patients alone (83.6%), lack of break during shift (82.2%) and nursing difficult patients (71.3%)[1].

Veena. S. Rai(2016) Stress Management Among Students And Its Impact On Their Effective Learning. International Journal of Engineering Research and Modern Education (IJERME) ISSN (Online): 2455 - 4200 (www.rdmodernresearch.com) Volume I, Issue I, 2016. . Mismatch between the student and the teacher which can raise tension and cause stress, is one of the biggest reason why it attack to all the students. Lack of much family attention has also been a reason why it attacks to all students. Children generally stress. In addition to that the other reason of stress is insufficient sleep is a common cause and students all across the world are getting affected by stress because of it. Stress management among students in universities and college is a hit-or-miss matter. In order to tackle the ugly matter most of the college and universities schedule optional stress management classes, but students often lack the time to attend. An attempt is done through this paper to know the impact of stress among students and the necessity of managing it in order to make the learning effective[6]

Shafaghat et al. (2018), Occupational Stress and How to Confront It: A Case Study of a Hospital in Shiraz Tahereh, : This research evaluated factors affecting occupational stress and strategies for coping with it. This cross-sectional descriptive-analytic study was conducted in 2015. Occupational stress was rated as moderate among the studied nurses. Significant positive correlations were found between occupational stress level and less effective coping method, occupational stress level and work experience level, and ineffective coping methods and age. Moreover, a significant difference was seen

between men and women in terms of emotion-focused coping. Conclusion: According to the research findings, occupational stress was at a moderate level among the studied hospital nurses, indicating that the authorities need to focus on efforts to reduce occupational stress for nurses[5].

OBJECTIVES OF THE STUDY

To know the factors causing stress to the Private school Teachers.

To find the coping strategies to reduce stress.

HYPOTHESES OF THE STUDY

There is no significant difference among the factors causing stress.

There is no significant relationship between the coping strategies and reduce stress.

ANALYSIS OF FACTORS CAUSING STRESS

There are many factors which is causing stress to the Private school teachers. The main factors are work load, low pay, Work culture, Exam Result, Pedagogy of Students and Temporary job. The following regression analysis shows that influence on stress to the school teachers and the effects on coping strategies which is followed by the school management.

Table – 1 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.980[a]	.960	.959	.87389

a. Predictors: (Constant), F6, F3, F5, F1, F2, F4

The above table shows that R = .980, R square .980 and Adjusted R Square = .959. It indicates Factors of stress creates 98% over their job. The cumulative variables of these variables is formulated through following one way analysis.

Table – 2 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3517.763	6	586.294	767.713	.000[b]
	Residual	147.392	193	.764		
	Total	3665.155	199			

a. Dependent Variable: Copingstrategies

b. Predictors: (Constant), F6, F3, F5, F1, F2, F4

It was presented in the above table F = 767.713 P = .000 statistically significant at 5% level.

This reflected all the variables cumulatively responsible for coping strategies followed by the Management. The individual influence of all these variables is clearly mentioned in the following co-efficient table.

Table – 3 Coefficients[a]						
Model B		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		Std. Error	**Beta**			
1	(Constant)	-.240	.273		-.879	.380
	Exam Results	.539	.196	.161	2.755	.006
	Work culture	.639	.269	.153	2.375	.019
	Temporary job	.397	.263	.088	1.509	.133
	Low pay	.851	.237	.254	3.583	.000
	Student's Pedagogy	.497	.168	.161	2.968	.003
	Work load	.736	.228	.198	3.234	.001
a. Dependent Variable: Copingstrategies						

It was showed in the above table Exam Results (Beta = .161, t = 2.755, P = .006), Work culture (Beta = .161, t = 2.755, P = .006), Temporary Job (Beta = .161, t = 2.755, P = .006), Low pay (Beta = .161, t = 2.755, P = .006), Student Pedagogy (Beta = .161, t = 2.755, P = .006), Work Load (Beta = .161, t = 2.755, P = .006) are statistically significant at 5% level. This indicates that factors of stress affected by the teachers and coping strategies helpful to the teachers to overcome from these factors and to achieve what the management expected.

FINDINGS AND CONCLUSIONS

There are many factors which is causes stress to the school teachers such as Work load, Low pay, Exam results, student's pedagogy and temporary job.

The most affected factors are Low pay and work load. The teachers are getting stress because of low pay and more work load. This will affect the job performance and their family.

The coping strategies which is followed by the Management such as arranging tour, Yoga to the teachers, Sanction of leave, Promotion and career development programmes reduce stress.

It concludes that the teachers are concentrates their achievement what the management expected because of coping strategies. The Management should have to follow the coping strategies to satisfy the teachers in their Job.

TESTING OF HYPOTHESES

There is no significant difference among the factors causing stress - Rejected

There is no significant relationship between the coping strategies and reduce stress – Rejected.

Conflict of Interest – Nil

Ethical Clearance – Taken From Ugc Committee

Source of Funding- Self

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Evaluation of the Influence of Surface Treatment of Artificial Tooth on the Adhesive Bond Strength to a Commercially Available Denture Base Resin-In Vitro

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ABSTRACT

Purpose: Purpose of the study is to evaluate the effect of pre-processing treatment of ridge-lap surfaces of acrylic teeth, air abrasion, chemical modification or combination of both on the strength of the bond between the teeth and the denture base resin..

Materials and method: Total of 32 tooth-acrylic resin samples were equally divided into four groups consisting of eight samples each.. The ridge-lap surfaces of each tooth was flattened to the designated level with a tungsten carbide acrylic bur and finished and polished. Ridge lap area of each group was subjected to pre-processing surface treatment like No treatment, air abrasion, chemical application and combination of both respectively. Wax cylindrical specimen of 20 mm X 17 mm dimensions were obtained using PVC pipes. Acrylic teeth were placed on the wax cylindrical specimens and acrylized. All samples were subjected to bond strength evaluation. Shear load testing was carried out in the Universal testing machine. The failure surfaces were subsequently examined under a stereomicroscope.

Results: Obtained data was subjected to statistical analysis. The ultimate shear strength value obtained amongst all the test groups was the highest (89.18 Kgf) for Group IV, thereby indicating the effect of combination of air-abrasion and MMA conditioning. Although the highest shear bond strength value seen in Group II (69.56 Kgf) was similar to Group III (69.29 Kgf), yet it was higher than highest value seen in Group I (54.65 Kgf).,

Conclusion: There was a significant effect produced on the shear bond strength of the interface when both MMA application and air-abrasion of the ridge-lap surfaces was carried out. When done singly, these modalities showed numerically higher bond strength values but these values were not statistically significant in comparison to the control group in which no treatment was carried out.

Keywords: *Bond strength, artificial teeth, Surface treatment*

INTRODUCTION

Majority of commercially available, pre-formed artificial teeth are essentially made of acrylic or vinyl-acrylic resin; which is chemically very similar to acrylic resin used in denture construction[1]. Consequently, this inherent ability to chemically bond to the denture base along with higher shock absorbability and ease of adjustment, has led to widespread use of acrylic teeth in removable prosthodontics[2]. Therefore, adhesive bond strength between denture base resin and artificial teeth constitutes one of the most important considerations in the technical procedure related to the fabrication of removable dentures[2, 3, 4] However, there are only few studies on sandblasting of the denture base and limited

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information is available on the use of sandblasting to increase the bond strength of a denture tooth to denture base[5].

Against this backdrop of scarcity of information, this prospective interventional in-vitro study was aimed at evaluating the effect of pre-processing treatment of ridge-lap surfaces of acrylic teeth, on the strength of the bond between the teeth and the denture base resin. Thus the objective of the study is to evaluate the effect of MMA application, air abrasion and combination of MMA application and air abrasion on the shear bond strength of denture tooth-base interface.

Materials and Methods

Specimen Preparation

For purpose of the study, a total of 32 tooth-acrylic resin samples were equally divided into four groups as Group I- No surface treatment, Group II - Mechanical modification of ridge-lap surface by air-abrasion with 110-µm aluminum oxide particles at 4.9 Kgf/cm^2 air pressure at 1 cm distance for 10 seconds, Group III-Chemical modification by application of methyl-methacrylate monomer 10 minutes before acrylic resin packing and once just before packing of denture base and Group IV- Combination of aforementioned modalities with air-abrasion done at the initial stage and MMA conditioning done prior to acrylic resin packing. Specimens of 20 mm X 17 mm dimensions wax cylinders were obtained using PVC pipes (Fig 1). 32 cross-linked acrylic first maxillary molars were taken of a single manufacturer (Lactodent, Pyrax polymers, Roorkee, India) for the study.

A line 1mm occlusal to the ridge-lap surface of the tooth was marked on the palatal aspect using a digital vernier caliper (Mitutoyo Inc. Japan) and continued all around the tooth. The ridge-lap surfaces of each of the 32 teeth were flattened to the designated level with a tungsten carbide acrylic bur and finished and polished

Acrylic teeth were placed on the wax cylindrical specimens after respective surface treatment with their long axis perpendicular to the bottom of the cylindrical wax forms (Figure 1). Prepared specimens were then invested and acrylized using heat cure denture base material.

Figure 1: Acrylic resin tooth-wax pattern showing sharply defined junction

Figure 2: Shear load testing carried out in INSTRON 3366 with the specimen attached to the fixture

Upon successful retrieval of cured specimens, conventional finishing and polishing procedures, careful inspection of the tooth-acrylic junction was carried out to make sure that there was no overlap at the interface so as to accurately subject it to shear loading forces.

All the specimens were stored in distilled water for 24 hours before subjecting them to bond strength evaluation.

Shear load testing was carried out in the Universal testing machine (Instron 3366, UK) equipped with computer control, data acquisition and data analysis software (Bluehill software version 2.18.713). Prepared acrylic specimens were mounted on a specially designed fixates on the universal testing machine mounting

table (figure 2) and shear load was applied at a cross-head speed of 0.5 mm /minute. During the testing, the fixture holding the acrylic resin-tooth sample was so aligned that the shearing blade was located exactly at the interface between the acrylic teeth and the denture base material on the buccal surface of the resin tooth. While performing the test, care was taken that shearing tool had low friction, sharp and hard edges and induced failure with no significant bending/rotation of the sample.

OBSERVATIONS AND RESULTS

Data was analyzed using statistical package SPSS Mean values and standard deviations were calculated for the ultimate shear bond strength values for different test groups. One-way ANOVA test to determine any significant differences between the test groups was carried out. Subsequently, a Tukey's post-hoc analysis was conducted and results were expressed as maximum compressive load in Kgf and 'p' value at or less than 0.05 was considered statistically significant.

TABLE 1: **Shows individual shear bond strength values (Kgf) of various specimens after respective surface treatment.**

SAMPLE	GROUP I NO TREATMENT	GROUP II MMA LIQUIDAPPLICATION	GROUP III AIR-ABRASION	GROUP IV MMA APPLICATION + AIR-ABRASION
SAMPLE 1	54.65	60.34	31.17	88.04
SAMPLE 2	48.53	52.07	59.42	38.61
SAMPLE 3	45.81	57.29	39.81	62.71
SAMPLE 4	36.77	60.43	42.53	66.70
SAMPLE 5	49.27	42.41	58.11	67.30
SAMPLE 6	39.38	58.21	39.46	46.67
SAMPLE 7	40.53	69.56	69.29	89.18
SAMPLE 8	35.23	57.61	44.10	53.24

The samples were subjected to shear forces in Universal testing machine and the maximum compressive load values of each of the four test groups was determined (Table 1). The ultimate shear strength value obtained amongst all the test groups was the highest (89.18 Kgf) for Group IV, thereby indicating the effect of combination of air-abrasion and MMA conditioning. Although the highest shear bond strength value seen in Group II (69.56 Kgf) was similar to Group III (69.29 Kgf), yet it was higher than highest value seen in Group I (54.65 Kgf).

Subsequently, the mean shear strength values were computed. This value for Groups II, III and IV was numerically found to be higher than the mean bond strength value of the control group (Table 2).

TABLE 2: Shows descriptive analysis for each of the test groups showing mean shear bond strength values for each test group and also the 95% confidence limits for each.

TEST / GROUPS	N	Mean (Kgf)	Std. Deviation	Std. Error	95% Confidence Interval for mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Group 1	8	43.7713	6.83630	2.41700	38.0560	49.4865	35.23	54.65
Group 2	8	57.2400	7.73957	2.73635	50.7696	63.7104	42.41	69.56
Group 3	8	47.9863	12.84122	4.54006	37.2507	58.7218	31.17	69.29
Group 4	8	64.0562	18.09708	6.39829	48.9267	79.1858	38.61	89.18
Total	32	53.2634	14.13671	2.49904	48.1666	58.3603	31.17	89.18

Thus, all three pre-processing surface treatment modalities had a positive effect on mean shear strength of the denture tooth-base joint in comparison to the case in which no treatment was done.

The mean shear strength values obtained after measurement were subjected to one-way Analysis of Variance or one-way ANOVA test. From this analysis, it is evident that there was a significant difference in mean maximum compressive load among the 4 study groups depending upon the tooth surface conditioning carried out (p value-0.011).

Subsequently, Tukey's post hoc analysis was performed to evaluate the significant differences in between any of the 2 groups.

TABLE 3: Shows Tukey's post-hoc analysis between various test groups to significant pair differences.

Group 1	Group 2	Mean Difference	Std. Error	Significance	95% Confidence Interval	
					Lower Bound	Upper Bound
Group I	Group II	-13.46875	6.11881	.148	-30.1750	3.2375
	Group III	-4.21500	6.11881	.900	-20.9213	12.4913
	Group IV	-20.28500*	6.11881	.013	-36.9913	-3.5787
Group II	Group I	13.46875	6.11881	.148	-3.2375	30.1750
	Group III	9.25375	6.11881	.444	-7.4525	25.9600
	Group IV	-6.81625	6.11881	.684	-23.5225	9.8900
Group III	Group I	4.21500	6.11881	.900	-12.4913	20.9213
	Group II	-9.25375	6.11881	.444	-25.9600	7.4525
	Group IV	-16.07000	6.11881	.063	-32.7763	.6363
Group IV	Group I	20.28500*	6.11881	.013	3.5787	36.9913
	Group II	6.81625	6.11881	.684	-9.8900	23.5225
	Group III	16.07000	6.11881	.063	-.6363	32.7763
*. The mean difference is significant at the 0.05 level.						

Post hoc analysis revealed that Group IV had significantly higher mean compressive strength than Group I (Table 3). No significant differences were present in any of the group comparisons.

DISCUSSION

Bonding failures between artificial teeth and heat-polymerized denture base resins are a result of multitude of factors such as excessive stress, fatigue, insufficient tooth cleaning during denture base resin placement, wax and tinfoil substitute contamination, defective properties of materials[3,6,] and inappropriate heat-polymerizing technique[3,7].

The strength of bond between the denture tooth and the denture base has been ascribed to a combination of factors[8]. Such factors have been investigated with different testing methods such as ridge lap grinding diatoric placement, chemical modification, differing mode of polymerization etc. and the resulting data have been used to suggest technical procedures to enhance this bond.

The present study examined changes in the shear bond strength of a single brand of acrylic tooth with a denture base resin, after subjecting it to three differing modes of tooth-surface conditioning prior to conventional heat-processing procedures.

The ridge-lap surface of these cross-linked teeth was flattened to the designated level of 1 mm above the actual ridge-lap base to achieve a flat, uniform surface area of contact with the acrylic resin. Caswell et al.[9] in 1986 showed that reduction of the base of the tooth increased the depth of bond and overall tensile strength of the tooth. Chemical modification of the ridge-lap area by application of methyl-methacrylate monomer is an accepted surface-treatment modality [2,5,10].

As stated by Nishigawa et al.[4] and other authors[10], free MMA in the dough-state resin causes the plastic tooth resin surface to swell up and dissolve, which promotes its adherence to the heat-cured acrylic resin. A factor of concern for such surface treatment is the MMA wetting time, which has been shown to be of much importance in adhesion between acrylic resins by Vallitu et al.[11] Varying MMA wetting-time protocols have been followed by investigators leading to differing results.[2,5,11] Bragaglia et al.[3] etched tooth bases twice with a methylmethacrylate monomer 10 min before acrylic resin packing and just before packing as a surface treatment regimen for their study. The same protocol was followed for the current study.

However, the results of studies in which this modality of surface treatment was carried out, as a method to improve bonding, have largely been contradictory; thus warranting the present investigation[3,4,12]

Also, the mode of polymerisation followed for the current study was a thermal mode. Old and recent studies[5, 13] have shown numerically lower denture tooth-base bond strengths with microwave-polymerised specimens owing to uncontrolled temperature rise which results in formation of pores, especially in thicker areas. This is of clinical relevance as thickness of the denture base material in the tooth-bearing areas might promote pore formation. Unlike microwave polymerisation, thermal mode of polymerisation results in better mechanical properties of the denture and thus, is the most widely used method[14].

Bond strengths of various interfaces related to dental materials may be measured in terms of the ultimate shear strength, ultimate tensile strength, ultimate flexural strength or through photo-elastic analysis.

Although considered a reliable modality to test the desired mechanical variable, photo-elastic analysis is however, much dependent upon the homogeneity of the specimen[23]. Evaluation of bond strength through 3-point and 4-point flexural loading also, does not provide actual material property data. On the contrary, it provides accurate structural data dependent on inherent material and specimen geometry[15]. The tensile loads used in many artificial tooth bond strength studies are not representative of real conditions either. The anatomic shape of posterior teeth and the direction of occlusal forces make the occurrence of significant tensile forces over these teeth unlikely[16]. On the other hand, shear and compressive loads are much more plausible clinically, as carried out in a majority of studies[3] including the current one. Ideally, the shear bond strength is calculated by measuring the bond surface area but in this study as in other recent studies, the same was not done due to complexity of the curves obtained.

Furthermore, all modalities of surface treatment demonstrated numerically stronger bonds between tooth and denture base than non-treated samples; although not all were significantly strong (Table 3). Conditioning of tooth surfaces with 2 coats of MMA liquid resulted in better shear bond strength than air abrading the ridge-laps with 110 μm alumina particles. These results were similar to the observations of Saavendra et al.[17] but in contrast to the conclusions of Consani et al.[18] This difference could be attributed to the fact that they conducted their study using microwave-polymerised denture base resin and varied MMA wetting time.

CONCLUSION

From the results obtained it can be concluded that, there was a significant effect produced on the shear bond strength of the interface only when both MMA application and air-abrasion of the ridge-lap surfaces was carried out. When done singly, these modalities showed numerically higher bond strength values but these values were not statistically significant in comparison to the control group in which no treatment was carried out. Also, application of MMA over the ridge-lap area yielded better results than air-abrasion with 110 μm alumina particles.

Ethical Clearance- Permission taken from institutional research committee. Animal or human subjects are not involved in the stuy.

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Prevalence of Depression among the Post-Menopausal Women in the Field Practice Area of Saveetha Medical College and Hospital, Thirumazhisai, Tamil Nadu

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ABSTRACT

Background: Currently in India, no national health program serves and promotes the specific health needs of postmenopausal women.

Objectives: To determine the prevalence of depression and to assess the level of depression among the post-menopausal women in the field practice area of Saveetha Medical College Hospital- Thirumazhisai, Tamil Nadu.

Method*:* A community based cross-sectional study was conducted from May 2017 to July 2017. The sample size was calculated as 171. Data was collected using a structured interview schedule among postmenopausal women.Data was entered and analyzed by using IBM SPSS software version 19.

Results: *T*he mean age of the study participants was 54.8 years and their average age of attaining menopause was 49.7 years. It was found that 75% of the women were found to be normal with no symptoms of depression and 22% of the postmenopausal women have mild grade of depression and 4% were found to have moderate grade of depression.

Conclusion*:* The health care services should pay more attention towards women's health in post-menopausal period.

Keywords: *Postmenopausal women, Depression, South India*

INTRODUCTION

Menopause is defined as the time of cessation of ovarian function resulting in permanent amenorrhea[1,2]. It represents the end of menstruation after the last menstrual period. Menopause occurs gradually and it indicates the transition from the reproductive to post-reproductive era of a women's life. According to the World Health Organization, it takes 12 months of amenorrhea to confirm that menopause has set in. In 1990, about 25 million women worldwide reached menopause; this number is expected to double by the late 2020s.[3] It was estimated that more than 130 million Indian women are expected to live beyond menopause by 2015.The average age of menopause in India is 47.5 years.[4] According to Indian Menopausal Society, there were about 65 million Indian women over the age of 45 years in 2006 in the menopausal group [5]. Although most women transition to menopause without experiencing psychiatric problems, an estimated 20% have depression at some point during menopause. [6-8]

Menopausal transition, or 'perimenopause', is a defined period of time beginning with the onset of irregular menstrual cycles until the last menstrual period, and is marked by fluctuations in reproductive hormones.

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[7] This period is characterized by menstrual irregularities; prolonged and heavy menstruation intermixed with episodes of amenorrhea, decreased fertility, vasomotor symptoms; and insomnia. Some of these symptoms may emerge 4 years before menses ceases.[8] Depression during perimenopause is likely due to fluctuating and declining estrogen levels [9].

A study conducted in Mangalore city, Karnataka, South Indiaon problems associated with menopause found that the significant signs included hot flushes, headache, urinary tract infection, back pain, muscle pain, insomnia, depression & mood disturbances. Experts believe that women are more prone to develop depression secondary to hormonal changes that take place through their life time as well as monthly variations of the menstrual cycle. [10]

Investigations from the Harvard study of Moods and cycles recruited premenopausal women aged 36-44 years with no history of major depression and followed up these women for 9 years to detect new onsets of major depression. Women who entered peri-menopause were twice as likely as women who had not yet made the menopausal transition to have clinically significant depressive symptoms. [11]

Psychological problems and particularly depression is one of the problems menopausal women face in the modern societies. Depression is one of the most common psychiatric disorders, which is not limited to specific time, place or person and includes all groups and society[12]. There are several causes underlying depression associated with menopause. Some of these factors include previous history of depression, personal and cultural issues. The attitude of women about menopause has an important role in the creation or elimination of the problems. [13]

In Indian scenario, menopausal health demands higher priority.[14] Currently in India, no national health program serves and promotes the specific health needs of postmenopausal women. Moreover, health programmes provides focused attention to women in the reproductive age group, ignoring those who have passed their reproductive stage.[15] Hence there is an urgent need to determine the prevalence of depression and to assess the level of depression among the post-menopausal women in the field practice area of Saveetha Medical college Hospital- Thirumazhisai, Tamil Nadu.

MATERIAL AND METHOD

Acommunity based cross-sectional study was conducted from May 2017 to July 2017. The study area was Thirumazhisai which is the field practice area of Saveetha Medical College & Hospital, Chennai, Tamil Nadu. Ethical clearance was obtainedfrom Saveetha Medical College Institutional Ethics Committee (SMC/IEC/2017/132). The study population consisted of all post-menopausal women in the area. Taking the prevalence of depression among postmenopausal women as 24.7%, with an alpha error of 0.05, limit of accuracy of 10%, the minimum sample size required for the study was calculated as 171.

All the women who had attained natural menopause were included in the study. Women who were in the transition period of attaining menopause, women who had undergone surgical menopause and women who did not give consent for the study were excluded. The participants were selected by multi-stage sampling method. Out of the 15 wards in Thirumazhisai town, 3 wards was selected by simple random sampling. The sample size required was equally distributed in the selected 3 wards. The investigator went to the center of the ward and selected the first house on the left hand side and thereby covering the required sample.

Data was collected by interview method using pretested, structured questionnaire translated in local language (Tamil). The study tool containedtwo parts, part I – Background Characteristics and part II - Hamilton Rating Scale for Depression (HRSD). The level of depression was assessed with the Hamilton Depression Rating Scale wherein a score of 0-7 was considered normal, 8-13 as mild depression, 14-18 as moderate depression, 19-22 as severe depression and individual with a score more than 23 was considered to suffer from very severe depression. Data was collected and entered in MS Excel. Analysis was done using IBM SPSS version 19 and proportions were calculated.

RESULTS AND DISCUSSION

The study was conducted among a total of 171 post-menopausal women in Thirumazhisai. The mean age of the study participants was 54.8 years and their average age of attaining menopause was 49.7 year. Table 1 shows the background characteristics. It was found that 75% of the women were found to be normal with no symptoms of depression and 22% of the postmenopausal women

have mild grade of depression and 4% were found to have moderate grade of depression (Table 3).

TABLE 1: BACKGROUND CHARACTERISTICS OF THE STUDY POPULATION.

VARIABLES	NUMBER OF WOMEN (N = 171)	PERCENTAGE (%)
AGE		
41-50 years	32	18.7
51-60 years	139	81.2
OCUPATIONAL STATUS		
EMPLOYED	10	5.84
UNEMPLOYED	161	94.1
AGE AT MENARCHE		
10-11 years	40	23.39
12-13 years	11O	64.32
14-15 years	21	12.2
AGE AT MENOPAUSE		
40-44 years	5	2.92
45-50 years	111	65.49
51-55 years	43	25.1
56-60 years	11	6.43

TABLE 2: DETAILS ABOUT THE SYMPTOMS OF DEPRESSION AMONG THE POSTMENOPAUSAL WOMEN.

SYMPTOMS	SCORE	RESPONSE (N = 171)	PERCENTAGE (%)
DEPRESSED MOOD	0	133	77.70
	1	32	18.70
	2	6	3.50
FEELINGS OF GUILT	0	152	88.80
	1	14	8.18
SUICIDAL THOUGHTS	0	162	94.70
	1	9	5.26
ANXIETY (PSYCHOLOGICAL)	0	116	67.80
	1	22	12.80
	2	32	18.71
SOMATIC SYMPTOMS (GENERAL)	0	98	57.30
	1	65	38
	2	8	4.60
INSOMNIA	0	110	64.30
	1	49	28.60
	2	12	7

TABLE 3: DETAILS ON THE GRADING OF DEPRESSION AMONG THE POSTMENOPAUSAL WOMEN.

GRADE OF DEPRESSION	SCORE RANGE	N	PERCENTAGE (%)
Normal	0 - 7	129	75%
Mild Depression	8 - 13	36	21%
Moderate Depression	14 - 18	6	4%
Severe Depression	19 - 22	0	0
Very Severe Depression	>23	0	0

The mean age of attaining menopause in the study was 49.7 years, which is similar to other studies done across India in various study settings.[14 -17] In this study, it was observed that overall prevalence of depression among the postmenopausal women was 25% which is lower in comparison with previous studies done by Akankshasingh et al[3], prevalence of depression was about 32.1% and another study done by Lawrence Dcruze, Ruma Dutta et al[4] showed prevalence of about 24.7% among the postmenopausal women.

The depressive symptoms have been graded into mild, moderate and severe by the Hamilton depression rating scale. Nearly 42.6% of women experienced somatic symptoms (Headache,backache, fatigability) and 32.16% of women had symptoms of Anxiety (Sweating, flushing, stomach cramps, urinary frequency) and 35.6% women had symptoms of insomnia, 5.2% of women had suicidal thoughts, 8% of women had symptoms of feeling guilt for even minor matters. All of these corresponds to symptoms of depression.

In the modern era, mental illness and discomfort can happen to all individuals' depression is a disease that is more common in women.[18-19] This study showed a significant percentage of women experiencing depression in postmenopausal period. Depression can be associated with certain other personal characteristics which include lifestyle situations, socioeconomic status and other associated factors. Depression in women can cause disability, impair their interpersonal, social functions and career. Thus, the diagnosis of depression and its relevant individual, social, and economic factors in women and providing training and advice from the experts to the family and society will be helpful.

The presence of post menopausal symptoms may decrease the health related quality of life in women changes occurring in women during 40-60 years of age which requires proper attention, working women preferably may require more care due to dual responsibility. Working women due to more stress may have feeling of guilt, irritability, depression etc. The health care services should pay more attention towards women's health in post-menopausal period and appropriate therapy like HRT (Hormone Replacement Therapy) should be encouraged. Certain modifications in life style and some programmed interventions can provide the enhancement of positive healthy habits, reduce stress and can add quality to their life.

CONCLUSION

From the study conducted among 171 postmenopausal women 24.5% of postmenopausal women have symptoms of depression. About 21% has symptoms of mild depression and 3.5% of them have moderate depression

Among women who have symptoms of depression none of them sought medical care to reduce their symptoms. There is a rising prevalence of depression among the post-menopausal women. The most common menopausal complaints reported by the postmenopausal women were sleep disturbances, generalized fatigue, and mild depression.

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Is India Ready for Telerehabilitation?

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ABSTRACT

Introduction: As telerehabilitation is a novel method of service delivery with most research having been conducted in economically developed countries, the various factors that may affect its effectiveness should be identified when importing this idea to resource constrained countries.

Method: In depth semi-structured interviews of TR personnel in India were used to investigate the factors that influence the effectiveness of TR.

Result: The factors were determined as reduced access to TR in the government sector, better access to TR in private sector, government policies and procedures and funding for TR, cost effectiveness, technology used for TR, power and internet connectivity, device and accessories used for TR, storage of the TR videos, training required for TR, other professionals required for TR, acceptance of TR by professionals in India, acceptance of TR by patients or caregivers in India, computer literacy, severity of disorder being treated and follow up.

Conclusion: The current study suggests that strategies to overcome the factors must be directed at creating and supporting opportunities in resource constrained country to meet patients' needs, irrespective of location.

Keywords: *Effectiveness, resource constrained country, India, TR*

INTRODUCTION

Telerehabilitation (TR) constitutes a small part of the literature on telemedicine,[1] with very few studies being reported in India.[2] The literature indicates that while telemedicine, which started in 2001 in India, offers great opportunities to health care in general and for rehabilitation services,[3] it could be particularly beneficial for resource constrained countries, where access to basic health care is compromised by lack of services and skilled professional care,[4] by providing access to medical services in any part of the country or the world. Providing population in underserved countries with the means to access rehabilitation services has the potential to help meet previously unmet needs[5] and positively impact health services.[6] With an increase in the various disorders such as cerebro-vascular accidents, traumatic brain injury, global developmental delays in paediatrics, etc. that require rehabilitation interventions like physiotherapy, occupational therapy, speech language pathology and the like in India, and considering their dearth, a new method such as TR need to be considered for their intervention.

As reported by Mars,[4] to successfully implement TR in a resource constrained country, there needs to be awareness of TR and its scope of practice. As in many such countries, the academic teaching departments are largely unaware of TR. Mars[4] noted that clinicians who have used videoconferencing, Skype®, email and telephony for work have been driven by local need and the availability of infrastructure. Only a small percentage of rehabilitation professionals in the USA use TR for regular interventions due to issues such as limited access to the internet at work and poor technical support,[7] which is likely to be even less favourable in India. Poor electricity connection is a disadvantage

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in India, where nearly 45 million households are still waiting to get connected or gain access to some source of reliable and affordable electricity.[8] While TR appears to be a possible solution to overcoming the short comings, it has not been widely used in India, making it necessary for it to be either developed or imported. This raises the issues as to whether the TR systems used in developed countries,[7,9] can be imported to a country such as India, while ignoring the factors that could influence its effectiveness.

An exploration of the current status of TR in India was deemed necessary considering it being a new intervention system, where the challenges to its use may not only be technology related. The present study aimed at exploring the various factors that influence the effectiveness of TR when implemented in a resource constrained country.

METHOD AND MATERIALS

A formulative exploratory research design was used.[10] Purposive sampling of two psychiatrists and six speech language pathologists were recruited. Purposeful sampling was used to identify personnel who are especially knowledgeable about or experienced with TR in India.[10-11] Personnel who had been providing TR for less than one year were excluded owing to their lack of experience. Informed consent was obtained, after which each interview lasted an hour using Skype®. Interviews were done in English and were audio recorded.

The main questions covered the main content of the study subject and within them participants were encouraged to speak freely about their knowledge, attitudes and practices of TR.[12-13] Thematic analysis resulted in several categories and general findings emerging using coding, categorizing, delineating and connecting them.[14] Code-decoding of the transcripts were done, analyzed and compared by two independent researchers.

FINDINGS AND DISCUSSION

Political and financial factors

Reduced access to TR in the government sector. Having started in 2001, TR is more than a decade old in India. In the initial years, though, TR was not accessible to the public due to constraints such as lack of funding and changing political agendas. It was mainly accessed by the physicians for consultations amongst themselves. Patients accessing health services in the public sector do not have access to TR, unlike the private sector, where hospitals make use of information technology (IT). It has become accessible to the general population for direct interventions during the last 10 years in India.

Better access to TR in private sector. Participants stated that the technology has been well supported in private sector hospitals due to adequate funding, which contributes to generating a good income due to physician-patient TR consultations. TR for speech language therapy is mainly being provided by SLPs working in private facilities.

Government policies and procedures and funding for TR. There are no state or central government level rules or regulations to guide tele services in India, [15] which results in each organization having its own. This could lead to confusion or misunderstanding regarding the ethical obligations associated with the technology (figure 1).

"We had the symposium of digital mental health, where many people asked regarding the rules and regulations of teleconsultation, which we don't have at present in India" [Participant B].

"an international conference on telerehabilitation by the TR society of the USA and the TR society of India. Even I think they are at loggerheads regarding the policies, they are also not very clear about the terms and conditions." [Participant D].

Figure 1: Direct quotations of participants

The participants noted that TR has considerable potential in India to address the treatment gaps, but that while this is theoretically feasible, attempts to implement it in public sector facilities have not been successful.[15] Participant C stated that India has come up with supportive research regarding TR services, but unfortunately are unable to implement in real life situations (figure 2). This is associated with the appropriate funding available for research projects and not so for its real-life implementation. TR is mainly used for physician to physician consultations, and is being used in only one academic institute done speech language pathology services, as stated by participant D.

> In India, there is a lot of scope for telemedicine, theoretically. But practically it's not happening. That is what the government of India is working on. [Participant B]

Figure 2: Directquotation of participant

As stated by participant B, the Prime Minister of India is now working towards a 'digital India'. This is done by improved online infrastructure and increasing internet connectivity or by making the country digitally empowered in the field of technology, with three core components of digital infrastructure, delivery of services digitally and digital literacy.[16] It includes plans to connect rural areas with high-speed internet networks, which will make TR possible for people throughout the country.

Cost effectiveness. TR reduces the need for patients to travel to the hospitals to meet a physician or to a centre for speech language therapy, physiotherapy or occupational therapy services (figure 3). TR is convenient for patients who experience constraints that affect their ability to travel. Tindall et. al and Burns et. al identified TR to be cost effective for speech language pathology services.[17-18]

> "Parents find it hard to make it to the therapy appointments because they have to go for speech, they have to go for occupational therapy, they have to go physiotherapy, they have to so many other allied services and they are all in different place. So, reaching them and following up at home gets very overwhelming for certain parents. For them telepractice is helpful." [Participant A]

Figure 3: Direct quotation of participant

Infrastructural factors

Technology used for TR. Skype® was the most commonly used internet application used by most participants for their tele-services. Participant A reported that she also used other applications such as Hangout ® and face time on iPhone®. All participants used the inbuilt camera in the laptop, personal computer or the mobile phone.

Power and internet connectivity. The most common issues faced during TR sessions in India are power failures, low bandwidth and poor internet connectivity, with power outages occurring at least once a day. While remote TR personnel may have good internet connectivity and no power failures, this may not be the case for the patient. Weather conditions such as heavy rains, which are very common in many parts of India, can cause disconnections.

Device and accessories used for TR. Old devices, such as the laptop or a personal computer, can hinder the audio-visual clarity at both ends (figure 4). The TR personnel preferred the use of notebook or personal computers over mobile phones, as they provide clearer video and audio output. While the use of mobile phones

or tablets during TR can hinder effective communication, most of India's population cannot afford personal computers or laptops, with many having old computers that cannot accommodate modern communication software and takes long time to boot and start. Most household in India use computers or laptops for an average of 5.94 years.[19]

> "it should not happen that you have to log onto your desktop computer which is God's number of years old and it will take 5-20 minutes to act." [Participant C]

Figure 4: Direct quotation of participant

Storage of the TR videos. As stated by participants B, C and D, that these videos should be stored safely to ensure confidentiality of the patients. These videos are also required for future consultations and if possible for future research purposes. However, due to the large number of these videos, storage space becomes a problem, which needs to be addressed at both a policy and organizational level.

Personnel factors

Training required for TR. All the participants reported that no specific training in TR was obtained before starting these services in their respective organizations having been self-taught skills and learnt through trial, error and improvisation (figure 5). As stated by participant D, all TR service providers in India may not have received any formal training before starting to use it, suggesting that it is not too complicated to exclude untrained persons. Holla et. al[15] reported in their study that 52% technicians reported they have never undergone training and the rest had undergone training once.

> "We shared and learned. I would say often it was a trial and error." [Participant F]

Figure 5: Direct quotation of participant

Other professionals required for TR. IT personnel are required for a tele-session, to solve problems that happen with the system during the session and for later storage of the videos. As stated by participant E, while they can also help to retrieve these videos for later use, their lack of availability made it difficult to assist with the system during a tele-session, which results in the end users having to solve the problems by themselves.

Acceptance of TR by professionals in India. The participants thought that service provision through TR was not widely accepted by health professionals in India. As stated by Math, Moirangthem and Kumar[20], one main reason was that a physician would not want to liaise with another, which may be due to professional rivalry (figure 6).

> "For example, a physician in a district hospital wants to talk to a neurologist here or a paediatrician wanting to talk to a paediatric neurologist. A specialist would not like to take that kind of an advice." [Participant C]

Figure 6: Direct quotation of participant

The physicians in the government sector are already burdened with their own large number of patients, and therefore facing time constraints. India has one government physician for every 11528 people and one nurse for every 483 people.[20] This is associated with the dearth of physicians working in the government sector hospitals, which is also due to their low remuneration. But TR is well accepted by the physicians in the private sector, since the mentioned reasons may not be affecting their services. Most physicians in the government sector hospitals would welcome the use of TR as it would reduce their travel time to the various district hospitals or primary health care centres.

Most medical professionals were unaware of the use of TR for health purposes in India, which is a barrier to its growing use (figure 7).

> "In fact, last week I had been to an international conference and the person was so amazed and said that they were totally unaware that such a service is available. So, it's our fault and their poor knowledge. We have failed to publicize or their poor knowledge!" [Participant D]

Figure 7: Direct quotation of participant

Patient factors

Acceptance of TR by patients or caregivers in India. TR is welcomed by patient and their caregivers in India as it gives them access to health care services that are not locally available, and which they might not otherwise have benefited from. TR provides easy access to the professionals from any corner of the country. Parents feel empowered, wanting to learn and interact more during the sessions (figure 8).

> "So majorly it's the mothers who want to learn and they want to be in-charge of doing therapy for their children. We have many parents who call us and ask about us. But who sign up for real therapy are those who want to do and have that time and efforts to give that dedication." [Participant A]
>
> "Because it is convenient for them. It reduces expenses. They don't have to wait for long to see a doctor. So, its acceptance is definitely much better." [Participant B]

Figure 8: Direct quotations of participants

Computer literacy of patients and caregivers can also pose as a challenge to initiating the communication as well as during the TR session.[16, 22]

Severity of disorder being treated. A commonly raised obstacle by the participants A, G and H, who were speech language pathologists, was the challenge of providing language therapy to children who have severe autism or attention deficit hyperactive disorders in addition to poor eye contact (figure 9). Thus, as the severity of the disorder increased, therapy through TR mode proved to be more challenging than a face to face session. Similar findings were reported in studies conducted in developed countries.[23-25] Sessions need to be made creative for any paediatric cases to keep their interest going during the sessions.

"So I think a lot of this depended on how much or what severity of the problem of the child. We started with a child who had ADHD or very severe autism and moved into their issues with their activities and place and things like that. Those were the parents who did not find it very successful." [Participant A]

"in certain conditions like where the clinician should manipulate the oral structures of the child or the adult for treating conditions like motor speech disorders, TR is posing a limitation" [Participant H]

Figure 9: Direct quotations of participants

Participant D suggested the use of a trained aide at the site of the patient to assist in such situations. Participant C suggested inclusion of an onsite junior to be trained to aid the TR personnel, which could be a novel thought to be considered for future research and implementation.[26]

Follow up. The professional can access the patient from where he/she is and vice versa, if they are moving places within or outside the country. Participant A reported that paediatric patients improved through TR. She reported other modes of follow up, such as sending emails with the home therapy activities to the parents.

CONCLUSION

This study detailed that TR is an effective method of service delivery in a resource constrained country, where specialised services may not be available in remote areas of the country. However, a dearth of personnel was stated as a major challenge in the government sector hospitals, suggesting the need for public/private partnerships to address the country's growing health needs. The lack of government infrastructural support appears to be the main element influencing all the other factors, which would lead to its streamlining and obstacles to access financing or funding. Hence, this amounts to the medical and non-medical infrastructural restraints, scarcity of healthcare workers in the government sector and increased burden on the existing professionals, electricity and internet disconnection.

The current study recommends the need to address the factors when implementing TR in India and suggests that strategies to overcome them must be directed at creating and supporting opportunities in resource constrained country to meet patients' needs, irrespective of location.

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Impact of Government Policies on Job Insecurity in Alcoholic Beverages & Its Allied Industries in Tamil Nadu

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ABSTRACT

The main aim of this to study the awareness of employees of alcoholic beverages & its allied industries on the policies of the Government and to measure the influence of Government policies on job security of the employees . The researcher used factor analysis and regression analysis to find the result. The findings are the employees in the Alcoholic and Beverage industries are highly aware of the Government policies of subsequent changing Governments. They felt that the Government focuses mainly on public attraction for political mileage. It is also concluded that alcoholic and beverage industry is one of the income generating industry for the state government and support them to accomplish their election promises to the dynamic voters of Tamilnadu.

***Keywords**: Job Insecurity, Alcoholic Beverages.*

INTRODUCTION

Alcoholic beverages & its allied industries in Tamil Nadu are considered as fragile in nature due to changes in the policies of subsequent governments. The political parties always make strategies for wiping of liquor selling as poll promise to gain a political mileage. Any government which bans the liquor in Tamilnadu creates more impulse on the job security of employees in alcoholic beverages & its allied industries. At the time of ban, the employee's job is not secured anymore and the companies also do not show any interest for their security and welfare. The scenario compels them to self-motivate themselves to face the challenges of job insecurity during liquor bans. The employees plan various strategies to acquire skills and knowledge to switch over to some other companies or venture into the self-employment business.

When employees of Alcoholic industries lose their employment, the companies do not take any moral responsibility to protect their security and not make any arrangements for their income. They show their helpless empty hands to the employees to demotivate them. At the same time the subsequent Governments also do not worry about the employment problems of employees in alcoholic industries. Most of the public hate this industry as it harms the health of the consumers of liquor and their family, Government cannot directly supports the growth of alcoholic industry. In this situation the present research work throws light upon how the government policies directly create individual impact on employee's livelihood and security.

BRIEF LITERATURE REVIEW

Banu S. Unsal- Akbiyik, K. Ovgu Cakmak-Otluogl, Hans De Witte (2012), In this study the researcher found out that seasonal workers perceive higher job insecurity compared to permanent workers. They are also affectively less committed to their organizations than permanent workers. Furthermore, job insecurity does not mediate the relationship between contract type and affective commitment[1]

Beatriz Sora, Amparo Caballer and José María Perio (2010), In an innovative study the researchers attempted to measure the consequences of job insecurity for employees in the midst of liberation and globalization of the respective economies they argued that the job insecurity has tremendous impact over employees work attitude and intention. The results also revealed job insecurity adversely affects job satisfaction and organizational commitment. It perceived that work

stressor and negatively creative over employees attitude[2].

Bert Klandermans & Tinka van Vuuren (2010), In this study the researcher finds that job insecurity has adverse affects on psychological well being and it also self esteem. It also reveals that job insecurity even leads to job loss[3].

Bert Klandermans, John Klein Hesselink, Tinka van Vuuren (2010), In this study the researcher states that the impact of one's job loss depends upon the individual employment status. The job insecurity reflects health problems and the objective conditions, severity of job loss and depending upon employment status[4].

J.H. Buitendach, H. De Witte (2005), In this study the results revealed that there is small but significant relationships between job insecurity, extrinsic job satisfaction, job insecurity and affective organizational commitment. Job satisfaction was found to mediate the relationship between job insecurity and affective organizational commitment[5].

Claudia Bernhard-Oettel, Nele De Cuyper, Bert Schreursand Hans De Witte (2011), the researcher in this study investigates job insecurity affects the individual well being. Job insecurity is negatively related to organizational outcomes and it is associated with lower affective organizational commitment and higher turnover intentions[6].

David Campbell et al (2007), In this study examined that the workers fear of insecure jobs with lower levels of wage growth. Workers fears of unemployment are increased by their previous unemployment experience. They also fear about the future unemployment in the organizations[7].

GAPS IN LITERATURE

After reviewing the national and international literature pertaining to HR practices and job security of the employees, the researcher identified two important questions still remain unanswered.

1. What are the Government policies affects the employees

2. How the employees measure their unemployment problem due to Government policies?

So, this present research work attempts in this direction to answer the research questions.

OBJECTIVE OF THE STUDY

1. To study the awareness of employees of alcoholic beverages & its allied industries on the policies of the Government

2. To measure the influence of Government policies on job security of the employees in study domain.

HYPOTHESIS

1. There is no significant influence of employees' awareness regarding Government policies on their job insecurity.

METHODOLOGY

This research is based on the primary data obtained through a structured questionnaire. It consists of three parts namely a) Demographic profile, b) Awareness on government policies and c) Perception on job security. The first section is completely optional type in nature, whereas the second and third part are in terms of Likert's five point scale which ranges from strongly agree to strongly disagree.

Data collection

In Tamilnadu there are six thousand employees working in different alcoholic and beverages companies. The researcher intended to collect at least 5% of the total population. Researcher circulated 400 questionnaires and able to obtain 309 usable responses through convenience sampling method. Hence the sample size of the research is 309.

Data Analysis

The researcher used KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) Bartlett's test, factor analysis, one-way analysis of variance and linear multiple regression to analyses both independent and dependent variables. This analysis is useful to test the hypothesis and to verify the objectives.

ANALYSIS AND DISCUSSION

In the analytical part, the researcher applied KMO and Bartlett's test to test the normal distribution of the variables pertaining to awareness and job security. The table is presented below:

Table 1. KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.801
Bartlett's Test of Sphericity	Approx. Chi-Square	1974.940
	df	66
	Sig.	.000

From the above table it is found that all the variables are normally distributed and suitable for factor extraction. This would enable the researcher to identify the proper awareness on government policies and job security. The following table gives the factor segmentation and the variances belong to all the variables.

Table 2. Total Variance Explained						
Component	**Initial Eigen values**			**Extraction Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	3.195	26.623	26.623	3.195	26.623	26.623
2	3.037	25.306	51.929	3.037	25.306	51.929
3	1.045	8.705	60.634	1.045	8.705	60.634
4	.935	7.792	68.426	.935	7.792	68.426
5	.646	5.379	73.805			
6	.585	4.873	78.679			
7	.549	4.578	83.257			
8	.488	4.066	87.323			
9	.438	3.647	90.970			
10	.400	3.336	94.306			
11	.353	2.939	97.245			
12	.331	2.755	100.000			
Extraction Method: Principal Component Analysis.						

From the above table, it is found that the 12 variables of awareness are reduced into four factors namely attractive policies, disciplined approach, income generation, and temporary arrangement. The employees are well aware of these policies of the Government. In fact they are aware that these factors are only temporary arrangement for any Government. At the same time, they employ various strategies to manage the stop gap arrangements.

The total average scores of job security is considered as the dependent variable and the total average score of the four factors are considered as independent variables. A linear multiple regression analysis is applied on four independent variables and one dependent variable and the results are presented below:

Table 3 Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.422[a]	.178	.171	.71094
a. Predictors: (Constant), work duration, work environ, work overload, Relationship				

From the above table, it is found that the four independent variables are statistically significant to prove the impact of employee awareness on the dependent factors job security. The following table gives the designation for the fit of regression.

Table 4 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.001	4	13.750	27.205	.000[b]
	Residual	254.233	503	.505		
	Total	309.234	507			

a. Dependent Variable: job satisfaction

b. Predictors: (Constant), work duration, work environ, work overload, Relationship

The F-value and p-values are statistically significant at 5 percent level. This implies there is a valid and well defined relationship that exists between independent variables awareness and the dependent factors job security. The following table gives the nature of relationship among the independent and dependent variables individually

Table 5 Coefficients

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	1.919	.249		7.701	.000
	work overload	.008	.046	.008	.180	.858
	work environ	.487	.048	.415	10.239	.000
	Relationship	-.079	.044	-.086	-1.813	.070
	work duration	.036	.039	.044	.905	.366

a. Dependent Variable: job satisfaction

From the above table, it is found that all the four factors are significant with F-values, t-values and p-values. This shows that there is a deep association between awareness of employees on Government policies of alcoholic and beverage industries and their own job security.

FINDINGS AND CONCLUSIONS

The employees in the Alcoholic and Beverage industries are highly aware of the Government policies of subsequent changing Governments. They felt that the Government focuses mainly on public attraction for political mileage. The political parties promote the ban on liquor as a temporary arrangement but they depend upon this industry to implement the development policies of their government. They also strongly agreed that all the Government in Tamilnadu do not worry about their job security, livelihood, employment and development. During every election their employment become very fragile and they become victims of their political mileage. It is also concluded that alcoholic and beverage industry is one of the income generating industry for the state government and support them to accomplish their election promises to the dynamic voters of Tamilnadu.

Conflict of Interest – Nil

Ethical Clearance – Taken From Ugc Committee

Source of Funding- Self

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Effectiveness of Social Media Marketing

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ABSTRACT

The main aim of this study is to know about the demographic profile of the customers of social media marketing and to analyse the effects of various forms of social media marketing on the firm's sales and other activities. The researcher used regression analysis, percentage analysis to find the result. It finds that the firms are achieved their target because of social media marketing. The firm's products are reached in all levels of customers through social media.Finally, it concludes that, Companies should create innovative customer experiences and specific strategies for media to identify the best path for driving up social media marketing performance.

Keywords: *Social media, Social relationships.*

INTRODUCTION

People are exposing themselves to more and more digital and social media. This is for many purposes, including in their roles as consumers as they search for information about products,[1] purchase and consume them, and communicate with others about their experiences. Marketers have responded to this fundamental shift by increasing their use of digital marketing channels. In fact, by 2017 approximately one-third of global advertising spending is forecast to be in digital channels [6]. Thus, future consumer marketing will largely be carried out in digital settings, particularly social media and mobile. It is therefore necessary for consumer research to examine and understand consumer behavior in digital environments. This has been happening over the last decade, with increasing amounts of research focusing on digital consumer behavior issues.

Social media marketing is marketing using online communities, social networks, blog marketing and more. It's the latest "buzz" in marketing. India is probably among the first proponents of social media marketing. These days, the organizational cause has replaced the social cause as companies seek to engage with their audience via the online platforms.

Social media is engaging with consumers online. According to Wikipedia, social media is internet-based tools for sharing and discussing information among human beings. Social media is all about networking and networking in a way that espouses trust among parties and communities involved. Any website which allows user to share their content, opinions, views and encourages interaction and community building can be classified as a social media. Some popular social media sites are: Facebook, YouTube, Twitter, Digg, MySpace, StumbleUpon, Delicious, Scribd, Flickr etc.

Social media is the medium to socialize. They use web-based technology to quickly disseminate knowledge and information to a huge number of users. They allow creation and exchange of user-generated content. Facebook, Twitter, Hi5, Orkut and other social networking sites are collectively referred social media.

Lazer and Kelly's (1973) define social marketing as "concerned with the application of marketing knowledge, concepts, and techniques to enhance social as well as economic ends. It is also concerned with the analysis of the social consequences of marketing policies, decisions

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and activities.

The interconnectivity of consumers through social media such as communities, reviews or recommendations is likely to establish trust in e-commerce. In SNSs, the social interaction of consumers helps their peers to develop or reject trust in a provider. Consumer socialisation occurs through social media directly by social interactions among consumers, and indirectly by supporting product involvement (Wang et al. 2012). The social relationship of consumers generated through social media significantly affects the perceived trust of consumers (Pan &Chiou 2011).

The role of social media in marketing is to use it as a communication tool that makes the companies accessible to those interested in their product and makes them visible to those that don't know their product. It should be used as a tool that creates a personality behind their brand and creates relationships that they otherwise may never gain. This creates not only repeat-buyers, but customer loyalty. Fact is social media is so diversified that it can be used in whatever way best suits the interest and the needs of the business.

REVIEW OF LITERATURE

P. Sri Jothi, et al(July 2011)Analysis of social networking sites: A study on effective communication strategy in developing brand communication..Journal of Media and Communication Studies Vol. 3(7), pp. 234-242, July 2011It is necessary to study the effectiveness of brand communication strategy followed in social networking sites which are mainly accessed by Indian users. This research attempts to find the effectiveness of brand communication strategy in promoting and advertising their brand in social networking sites. The effectiveness is determined with the help of survey from people who use these sites, and the content of three social networking sites is analyzed[9].

Georgios Tsimonis and SergiosDimitriadis(Sep 2013).Brand strategies in social media .– The purpose of this paper is to: first, examine whycompanies create brand pages in social media, how they use them, what policies and strategies they follow, and what outcomes do theyexpect; and second – from firms' point of view – how users are benefited from such pages. The main actions of the firm are making prize competitions, announcing new products/ services, interacting with fans, providing advice and useful information, and handling customer service issues[3].

Afrina Yasmin, et al(April 2015)Effectiveness of Digital Marketing in the Challenging Age: An Empirical Study.International Journal of Management Science and Business Administration Volume 1, Issue 5, April 2015, Pages 69-80The main objective of digital marketing is attracting customers and allowing them to interact with the brand through digital media. This article focuses on the importance of digital marketing for both marketers and consumers. We examine the effect of digital marketing on the firms' sales. Additionally the differences between traditional marketing and digital marketing in this paper are presented. This study has described various forms of digital marketing, effectiveness of it and the impact it has on firm's sales. The examined sample consists of one hundred fifty firms and fifty executives which have been randomly selected to prove the effectiveness of digital marketing. Collected data has been analysed with the help of various statistical tools and techniques[1].

Sita Mishra(May 2015)understanding social media mindset of consumers: an Indian perspective.JISTEM - Journal Of Information Systems And Technology Management Vol. 12, No. 2, May/Aug., 2015 pp. 203-218 .In the present paper the emphasis is upon the analyses of the social media mindset of consumers in India, and examining the impact of various variables of extended TAM in order to explain the variables that influence level of acceptance of SNS by Indian consumers. Results indicated positive and significant effects of perceived usefulness while perceived risk influenced negatively. Further, perceived ease of use and personal fit with brands both found to have a positive effect on marketing through SNS but were not significant. The results of present study in India pointed out that establishing personal fit with consumers and providing userfriendly web sites, and reducing the perceived risk has impact on developing positive attitudes[8].

Karla Barajas-Portas(Sep 2015)The Impact of Consumer Interactions in Social Networking Sites on Brand Perception Journal of Internet and e-Business Studies Vol. 2015 (2015), Article ID 197131, The aim of the present research is to explore the impact of the interaction on the brand perception using as base the Social Networking sites. We propose an extended model which provides relevant information of the evolution of brand perception, considering one of the most relevant processes for the human being: socialization as interaction

through Social Media. The study was conducted in order to obtain the data with users of at least one Social Networking Site. We present a Brand perception scale measured as a combination of 5 dimensions: Affective perception, Functional perception, Reputation, Brand Experience and interaction through Social Media. The relevance of the research is based on the importance of the generation of innovative ways of being close to the consumer[5].

F. Safwa Farook, NalinAbeysekara(Dec 2016) Influence of Social Media Marketing on Customer Engagement .International Journal of Business and Management Invention ISSN (Online): 2319 – 8028, ISSN Volume 5 Issue 12.The study examined the influence social media marketing has on customer engagement. The study was decided to be investigated as we can see that organizations spending on social media continue to soar, but measuring its impact remains a challenge for most businesses. All in all, social networking sites facilitate active communication between companies and users and spur interactions among users. Here he need arrived to find out the factors influencing customer engagement; to explore what content they enjoy most on a Facebook brand page. The findings of this study revealed the five factors that have a significant impact on customer engagement[7].

Haslinda Musa, et al(2016) Analysing the Effectiveness of Social Media Marketing. The purpose of the paper is to report on the process and findings of factors that influence the effectiveness of customer engagement, brand reputation & image, and customer brand attitudes towards online performances of Small and Medium Enterprises (SMEs) in Melaka. The paper contains sufficient details to support that objective and suitable to be presented at the conference. Besides, this paper examines the relationship between factors influencing effectiveness and SMEs performance and also examined the key determinants of those factors towards SMEs performances. A literature review is presented to explain the effectiveness of social media marketing towards SMEs performances. In additional, a survey was carried out through questionnaire in the area of Melaka. The effectiveness of social media marketing contributes to SMEs success and contribute to their growth in the future, although some problems are acknowledged[4].

Pavel Ciprian (2017).The Growing Importance Of Social Media In Business Marketing.The growing importance of social media marketing among businesses is very clear. So the question is no longer if you must use the social media tool in your marketing activities, but how to do it better. Business owners should pay attention to which social platforms help them reach their goals with relevant audiences, whether that's generating sales or greater visibility[6].

Fawad Khan et al(2017),The Importance Of Digital Marketing. An Exploratory Study To Find The Perception And Effectiveness Of Digital Marketing Amongst The Marketing Professionals In Pakistan .The purpose of this exploratory research is to present the perceptions towards Digital Marketing in Pakistan. This issue has rarely been addressed by the academicians and researchers in Pakistan and elsewhere. This study used digital marketing parameters to measure the awareness and effectiveness of digital marketing among marketing professionals in Pakistan. The result suggests that professionals in Pakistan are more sceptical towards digital marketing tools and concepts. They do not fully understand the benefits of digital marketing in terms of growth and cost effectiveness. Finally, the limitations of the studies and findings are presented in study[2].

OBJECTIVES OF THE STUDY

To know about the demographic profile of the customers of social media marketing.

To analyse the effects of various forms of social media marketing on the firm's sales and other activities.

HYPOTHESES OF THE STUDY

There is no significant influence of demographic variables of social media marketing dimensions.

There is no significant influence of various forms of social media marketing.

METHODOLOGY AND ANALYSIS OF THE STUDY

This study is based on both primary and secondary data which is collected from various journals and books. Primary source is a source from where we collect first-hand information or original data on a topic. Interview technique was used with structured questionnaire for the collection of primary data.

Table – 1 Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25-35	54	54.0	54.0	54.0
	35-45	46	46.0	46.0	100.0
	Total	100	100.0	100.0	

In the above table shows that 54% of the customers are the age group of 25-35 followed by the age group of 35-45 are 46%. The age group of 25-35 are dominated in this study.

Table – 2 Category of customers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	students	35	35.0	35.0	35.0
	Bachelors	38	38.0	38.0	73.0
	House wifes	3	3.0	3.0	76.0
	Others	24	24.0	24.0	100.0
	Total	100	100.0	100.0	

The various categories of customers are presented in the above table . 35% of students followed by 38% of Bachelors and housewives of 3% are purchased through social media marketing. The Bachelors are purchased more than the others.

EFFECTIVENESS OF SOCIAL MEDIA MARKETING

Table – 3 One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Brand awareness	100	3.17	1.457	.146
Goodwill	100	3.17	1.303	.130
Profit	100	2.61	1.675	.168
Loyal Customers	100	3.07	1.328	.133
Target achievement	100	3.27	1.462	.146
Increased sales	100	3.71	1.217	.122

Table – 4 One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Brand awareness	21.760	99	.000	3.170	2.88	3.46

Cont... **Table – 4 One-Sample Test**

Goodwill	24.327	99	.000	3.170	2.91	3.43
Profit	15.581	99	.000	2.610	2.28	2.94
Loyal Customers	23.123	99	.000	3.070	2.81	3.33
Target achievement	22.361	99	.000	3.270	2.98	3.56
Increased sales	30.489	99	.000	3.710	3.47	3.95

The table inferred that the effectiveness of social media marketing in the firms. The mean values of various dimensions are increased sales 3.271, Target achievement 3.270, Brand awareness and Goodwill are 3.170, Profit 2.610. It shows that the firms sales are increased through the social media marketing but the profit is decreased because of reduced cost.

FINDINGS AND CONCLUSIONS

The brand awareness for customers increased due to social media marketing.

The sales are increased by the social media marketing. Hence the customers feel the cost of the products is less compared with other marketing.

The firms are achieved their target because of social media marketing. The forms products are reached in all levels of customers through social media.

Finally, it concludes that,Companies should create innovative customer experiences and specific strategies for media to identify the best path for driving up social media marketing performance.

Conflict of Interest – Nil

Ethical Clearance – Taken from UGC Committee

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Clinical Profile and Antibiotic Sensitivity Pattern in Pediatric Urinary Tract Infection of a Tertiary Care Hospital in Bhubaneswar, Odisha

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ABSTRACT

Background: Urinary Tract Infection (UTI) is the most common infection encountered in children and fever is the presenting symptom in most of the cases. It is very difficult to diagnose UTI in pediatric age group especially in young infants because of vague, minimal and non-specific, symptomatology. But its early diagnosis is important in children as it may be the marker of urinary tract abnormalities and secondly it can lead to pathological changes in kidneys and urinary tract if not promptly and adequately treated.

Objective: The aim of this study was to determine demographic pattern, clinical profile, common uropathogens involved and their antibiotic sensitivity/resistance pattern in all culture positive UTI cases in children admitted to a tertiary care hospital in Odisha, so that it will be very helpful to the paediatricians in this region in better management of UTI cases in children.

Methods: This retrospective analytical study was carried out at Kalinga Institute of Medical Sciences, Bhubaneswar during the period from January 16 to December 16. A total of 150 pediatric patients aged ≤ 15 yrs having culture positive UTI were included in the study. Newborns, acute kidney injury at the time of admission, chronic kidney disease cases were excluded.

Result: Fever was the common presenting symptom found in 76% children, vomiting was present in 20% and loose motion in 11.3%. Associated co-morbidity was detected in significant number (28.6%) of cases, that includes anemia, pneumonia, nephrotic syndrome, scrub typhus and sickle cell disease. Majority of our cases (70%) didn't have significant leucocyturia. Major organisms isolated in decreasing order were Escherichia Coli (45.3%), *Enterococcus fecalis* (34.6%) and *Klebsiella* spp (10%). *Proteus mirabilis* was isolated only in one case. Majority of *E. Coli*, *Klebsiella*, *Acinetobacter* and *Staphylococcus aureus* were sensitive to Amikacin but *Enterococcus* expressed high sensitivity to Linezolid and Vancomycin.

Discussion: UTI should be considered as a potential cause of fever in children even after confirming other disease in a febrile case; urine analysis should be done as UTI may be an associated disease. Further absence of fever is not a criterion to exclude the possibility of UTI. Urine culture should be done as a diagnostic evaluation even if routine analysis does not reveal leucocyturia or bacteruria.

Conclusion: UTI is one of the common bacterial infections in infants and children next only to respiratory infection. Delay in diagnosis and/or definitive treatment may lead to long term sequel like hypertension, renal failure and CKD. Thus it warrants a high level of clinical acumen from the treating paediatrician in diagnosing and initiating prompt and proper treatment.

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Keywards: *Pediatric urinary tract infection, antibiotic sensitivity pattern.*

INTRODUCTION

Urinary tract infection(UTI) is a common bacterial infection in infants and children, with overall prevalence ranging from 2% to 8% throughout childhood.[1,2] The diagnosis of UTI is often missed in infants and small children due to minimal and non-specific symptoms. Young children are more vulnerable for renal scarring due to immature kidney, which may later on cause hypertension, proteinuria and progressive renal failure[1]. The risk of recurrent UTI in children has been found to be around 12-30% in the first 6-12 months following initial UTI.[3] Beyond infancy female outnumber male[10:1][4]. Due to certain anatomic and physiologic factors children are at increased risk of developing UTI compared to adult, out of which vesicoureteric reflux(VUR) is most common[5]. A clinically suspected case of UTI always should be defined and confirmed with urine culture & sensitivity pattern in guiding clinician about treatment and appropriate radionuclear imaging evaluation.[6]

Even a single confirmed UTI should be taken seriously especially in children due to risk of renal parenchymal damage.[7] E.coli is the causative agent In majority (60-90%) of cases of UTI in children followed by Klebsiella, Enterococcous, Proteus, Pseudomonas, Citrobacter and Staphylococcal species[8,9]. The changing pattern of organisms and antimicrobial susceptibility in both community and hospital based pediatric UTI & its drug resistance has become a major challenge for its treatment and outcome[9,10]. With this background the present study was carried out to determine clinical profile and sensitivity pattern of uropathogens to commonly used antibiotics in all children with confirmed UTI cases admitted to a tertiary care hospital in Odisha.

MATERIALS AND METHODS

A retrospective study was conducted to find out the demographic pattern and antibiotic sensitivity pattern of uropathogens among all children aged ≤ 15 years with culture positive UTI admitted to the pediatric ward of a tertiary hospital in Bhubaneswar , Odisha from January 2016 to December 2016. Patients age, sex, presenting symptoms, results of urine microscopy, culture and sensitivity were noted. A total of 150 cases were included in study. Neonates, patients with acute kidney injury(AKI) at the time of admission and chronic kidney disease were excluded. Urine sample of 10 mL were routinely collected in sterile specican by mid-stream clean catch or trans urethal catheterization method depending on the patient's age and transported to hospital laboratory properly. The specimens were processed immediately. 5 µL loopful of the sample was inoculated on a blood agar and Cysteine Lactose Electrolyte Deficient agar[CLED media(Hi-media, Mumbai, India) (semiquntitative method)] and colony count was done after overnight incubation at 37^0C. Isolates were identified by Gram Stain and biochemical reactions. Number of colonies obtained were multiplied by 1000 to get the Colony Forming Unit(CFU/mL). Samples showing at least 10^5 CFU per mL of a single species were considered to indicate significant bacteriuric UTI. Guidelines by Hellerstein et al[11] was strictly adhered to for diagnosis of pediatric UTI. Antibiotic sensitivity was performed using Kirby-Baurer disk diffusion method following the Clinical Laboratory Standards Institute guideline[12].

Data management and statistical analysis were performed using spss software version 23 (SPSS Inc, Chicago, IL, USA). The variables were analysed using descriptive statistics.

RESULT

150(4.8%) cases out of total 3070 patients admitted to pediatric department during the study period had culture positive UTI. Table 1 shows the age and sex distribution of the children with UTI. There is a overall male preponderance with M:F ratio of 1.1:1, but the prevalence of UTI was more in female compared to male in above 2 years of age (M:F=1:1.4). The mean age of female was (7.5+/- 4.42)yrs, higher than that of male with (4.2+/-4.08)yrs. Table 2 highlights common presenting symptom among these children. Fever was the most common(76%) presenting symptoms followed by vomiting(20%), diarrhea(11.3%), dysuria(10%), hematuria (18%), seizure(6%) and abdominal pain(3.3%). Most of them had more than one symptoms. 110 (73.3%) children received some antibiotics before hospitalization. About 28.6% of UTI cases had co-morbidity like anemia(10%) followed by pneumonia (6%) and Scrub typhus, nephoitic syndrome, sickle cell disease in 5 cases (3.3%) each(Table-3). The no. of episodes of UTI were maximum in above 2 years age(Table-1). Leucocytosis was seen in 37.3% patients and 15.3% of patients had raised CRP(>10 mg/L). Urine analysis revealed bacteriuria in 9.3% cases and pyuria(> 5 leucocytes in HPF of centrifuged urine) in 30.6% cases(Table-4).

All patients had undergone ultrasonograpy of abdomen, out of which 14.6% had some form of abnormalities. Hydronephrosis was more common(7.3%) followed by renal calculi(2.6%) and thickened bladder(2.6%). Two patients had evidence of medical renal disease. Out of ten patients who had done their DMSA(dimercaptosuccinic acid) scan on follow up after 3 months, one had renal scar. Table -5 shows the organisms cultured from the urine of study patients. The predominant isolates were E. coli(68, 45.3%) followed by Enterococcous faecalis(51,34%), Klebsiella pneumonia(15, 10%) and Staphylococcus aureus(7, 4.6%). Acinetobacter, Pseudomonas aeruginosa and Proteus were the other organisms isolated. E. coli was more commonly seen in female patients(40/68, 58.8%) in contrast to Klebsiella which was isolated mainly from male patients(14/15, 93.3%). A panel of selected drugs on commonly found organisms confirmed antibiotic sensitivity pattern(Table-6). Majority of E. coli, Klebsiella spp, Acinetobacter and Staph. aureus were sensitive to amikacin where as Pseudomonas showed 100% sensitivity to cefoperazone followed by amikacin, ceftazidime, ciprofloxacin and gentamicin each showing 66.6% sensitivity. Among Gram positive organisms Enterococcus faecalis was the most frequently isolated organism having sensitivity to vancomycin(98%), linezolid(100%) and nitrofurantoin(78.4%). One case of VRE(vancomycin resistant Enterococcus) was isolated from patient with posterior urethral valve who was later on admitted to PICU with uneventful recovery. E. coli was highly sensitive to nitrofurantoin(100%) which also showed good coverage against Staph. aureus(71.4%) and Enterococcus(78.4%). Cefoperazone was least sensitive to all organisms except Pseudomonas(100%) and Acinetobacter(80%). Extended Spectrum β-lactamase(ESBL) producing E.coli was isolated in eight(5.3%) patients and was sensitive to amikacin(100%) and nitrofurantoin(100%) but was resistant to other non-β lactam antibiotics like ciprofloxacin(75%), cotrimoxazole(100%) and gentamicin(100%). There was no difference between the community acquired ESBL E. coli UTI and non-ESBL E.coil UTI in regard to their presentation, age, renal abnormality, previous UTI and recent hospitalization.

Table-1 Age and sex distribution of children with Urinary tract infection

Age (in yrs)	Male (%)	Female (%)	P value
0-2(n=49)	38(77.55)	11(22.45)	<0.001
2 or more (n=101)	42(41.58)	59(58.42)	Pearson Chi-Square= 17.15

Table-2. Common presenting symptoms and signs in the patients with Urinary tract infection.

SN	Symptoms/Signs	Frequency	Percent (%)
1	Fever	114	76
2	Vomiting	30	20
3	Diarrhea	17	11.3
4	Abdominal pain	5	3.3
5	Body/ leg swelling	9	6
6	Hematuria	12	8
7	Dysuria	15	10
8	Frequent urination	4	2.6
9	Under weight	3	2
10	Seizure	9	6
11	Chill and rigor	6	4
12	Suprapubic tenderness	5	3.3
13	Toxic	4	2.6
14	Phimosis	4	2.6
15	Others	36	24
	Total	150	100

(N:B Total no of patients are 150, however, most of the patients presented with multiple symptoms).

Table 3. Types of co-morbidities associated with

Urinary tract infection

Diseases	**Frequency**	**(%)**
Anemia	15	10
Pneumonia	9	6
Scrub typhus	5	3.3
Nephrotic syndrome	5	3.3
Sickle cell disease	5	3.3
Acute glomerulonephritis	4	2.6
Total	43	28.6

Table 4. Urinary findings of patient with Urinary tract infection

Urine	**Findings**	**Number(%)**
Appearance	Normal and clear Cloudy Straw	120 (80) 10 (6.6) 12 (8)
Microscopy	WBC cast Epithelial cast Microscopic Hematuria Pyuria (<5 cells/HPF) Pyuria (>5 cells / HPF) Bacteria on Gram's stain	16(10.6) 38 (25.3) 12 (8) 104 (69.3) 34 (22.6) 14 (9.3)

Table 5: Correlation between organisms and gender and age of patient with UTI

Sex	**Male (%)** **Age (in yrs)**		**Female (%)** **Age (in yrs)**		
Organisim Isolated	</=5 yrs	>=5Yrs	>5Year	>5 yrs	Total
Escherichia coli	18 (26.4)	10(14.7)	17 (25)	23(33.8)	68
Klebsiella Pneumoniae	9 (60)	5(33.3)	1 (6.6)	-	15
Enterococcus	24 (47)	7(13.7)	6(11.7)	14(27.4)	51
Staph.Aures	-	2(28.5)	-	5(71.4)	7
Acinetobacter	2(40)	-	-	3(60)	5
Pseudomonas	2(66.6)	-	1(33.3)	-	3
Proteus	-	1(100)	-	-	1
Total	55	25	25	45	150

Table-6: Antibiotics sensitivity pattern of isolated uropathogens (% sensitive)

Organisms	E coli	ESBL E.Coli	Klebsiella Spp.	Pseudo monas	Acineto bacter	Proteus	Enterococcus	Staph. aures
Number	60	8	15	0	5	1	51	7
Amikacin	52(86.6)	8(100)	11(73.3)	2(66.6)	4(80)	1(100)	13(25.4)	6(85.7)
Gentamicin	23(38.3)	0	8(53.3)	2(66.6)	2(40)	1(100)	10(19.6)	5(71.4)
Ceftazidime	10(16.6)	1(12.5)	4(26.6)	2(66.6)	3(60)	1(100)	2(3.9)	2(28.5)
Ceftriaxone	13(21.6)	0	4(26.6)	0	1(20)	1(100)	4(7.8)	3(42.8)
Mox-clav	9(15)	0	4(26.6)	0	0	1(100)	18(25/2)	4(57.1)
Cefoperazone	9(15)	0	1(6.6)	3(100)	4(80)	0	0	0
NFT	54(90)	8(100)	7(46.6)	0	2(40)	0	40(78.4)	5(71.4)
Ciprofloxacin	54(90)	2(25)	6(40)	6(66.6)	2(40)	1(100)	3(5.8)	3(42.8)
Piperacilin	10(16.6)	0	3(20)	1(33.3)	3(60)	1(100)	4(7.8)	1(14.2)
Cotrimoxazole	6(10)	0	4(26.6)	0	3(60)	0	7(13.7)	2(3.9)
Cefuroxime	18(30)	3(37.5)	10(66.6)	2(66.6)	2(40)	1(100)	2(3.9)	3(42.8)
Pen.G	0	0	0	0	0	0	21(41.1)	1(14.2)
Vancomycin	0	0	0	0	0	0	50(98)	2(28.5)
Linezolid	0	0	0	0	0	0	51(100)	6(85.7)

NFT- Nitrofurantoin, Pen. G- Penicilin G

DISCUSSION

UTI is a common problem in children, whose prevalence varies with age and sex of children.[1,2,13] The prevalence rate of 4.8% in present study is comparable to other study in this country with a rate of 4%[14]. But this study contrasts with the study by Srivaths et al[15], who repoted the rate as 2.48%, the lowest from a developing country. Rabassa and Shattima[16] in Maiduguri reported a rate of 11.3% in children with severe protein energy malnutrition after screening for UTI. Though overall ratio of male and female in our study is 1.1:1, the incidence was slightly higher in female(1:1.4) in above 2 yrs which is quite different from other studies[1,2]. However our finding is similar to the study by Kalanter et al in which they found UTI more common in female(1.07:1)[17]. Akram et al in their study found all organisms were more common in female[8].

Similar to other studies[13,18,19] fever was the predominant presenting symptoms reported in 76% of patients. But more specific symptoms like loin pain, increased frequency of urination & dysuria in this study were less, reiterating the need for screening all febrile children without a definite focus for UTI.About 28.6% of our patients had associated co-morbidities like anemia, nephrotic syndrome, scrub typhus,pneumonia and sickle cell disease among which anemia was most common(10%). Majority(70%) of patients did not have significant pyuria which contrasts with previous studies, where Islam et al[19] detected in 92% of their cases in Bangladesh and Taneja et al[10] found in 53.6% of their cases.As per AAP Clinical practice guidelines updated in 2011 the sensitivity of pyuria varies from 32-100%[6]. More likely explanation for significant bacteriuria in culture without pyuria include delayed urine examination, contamination, insensitive criteria and asymptomatic bacteriuria[6]. Hence urine culture should be done as a diagnostic evaluation even if routine urine analysis does not reveal significant pyuria or bacteriuria. E. coli was the leading (45.3%) cause of UTI in our study, consistent with studies reported by Mashouf et al.(57.4%) in Iran,Brad et al.(47.1%) in Romania and Taneja et al.(47.1%) in India.[10,20,21] But Mouneke et al. in their study in Nigeria found E. coli in 13.6% of cases,[13] quite less than the other studies.[10,20,21] Data from above

studies are suggestive of E. coli as major uropathogens irrespective of country, community or hospital settings. Klebsiella species were found in 10% of patients similar to study from North India by Taneja et al.[10] who detected in 14.5% of cases. Similar to study by Esmaeili et al,[22] we had Klebsiella more isolated in male patients(14/15), the relevance of association needs further prospective study.

Pseudomonas aeruginosa and acinetobacter spp were found in 2% and 3.3% cases respectively which was not reported by Akram et al.[8] from North India. But in contrast our study did not show enterobacter spp. and streptococci spp. which was reported by earlier study[11] from other centre in India. Gram positive organisms have received more attention recently as a cause of UTI. Staph. aureus and Enterococci have been reported as important causes of UTI in children.[17, 20] Enterococci was isolated in 34% of cases in our study. Majority of E.coli and Klebsiella isolates were sensitive to amikacin followed by nitrofurantoin. Similar susceptibility patterns have been found in other studies.[9,19] Though ciprofloxacin was effective against the Pseudomonas(66.6%), Acinetobacter(40%) and Proteus(100%), Kalantar et al.[17] and Mashouf et al.[20] demonstrated extremely low susceptibility of Gram negative organisms to fluroqunolones and co-trimoxazole that are frequently used antibiotics for UTI in our populations. All cases of community acquired ESBL producing E. coli(CA-ESBL) were resistant to cephalosporins, penicillin, co-trimoxazole and gentamicin which was similar to the study by Kim Yun et al.23 where they found 61% of their patients showed antibiotic resistance to at least two non-beta lactam antibiotics. Majority(70%) of Gram positive organisms in our study had shown sensitivity to nitrofurantoin, vancomycin and linezolid which is same as the study from North India by Taneja et al.[10]

We observed a significant degree of antibiotic resistance among uropathogens with a tendency towards multi- drug resistance in Gram negative organisms. The possible reason for this among organisms isolated could be due to the high level unnecessary antibiotics use in our county.The worldwide trend of treating community acquired UTI empirically may not apply for specific geographic regions where decreased susceptibility rates are documented for common urinary pathogens. International guidelines are no longer applicable for treating UTI in a region, which have the tendency of changing antimicrobial sensitivity over a period of time regularly. Hence development of local guidelines based on susceptibility pattern is necessary for guiding emperical treatment before or in absence of urine culture when proper diagnostic modalities are limited in resource poor areas.

CONCLUSION

UTI is one of the common bacterial infections in infants and children next only to respiratory infection; fever being the most common presenting symptom. E. coli is the most common isolate in pediatric patients with UTI. Gram negative organisms are sensitive to amikacin, nitrofuantoin where as Gram positive organisms are mostly susceptible to nitrofurantoin, vancomycinn and linezolid. Multidrug resistant bacteria are now seen more commonly than before. Hence prospective regional studies should be carried out periodically to identify bacteriological profile and antibiotic sensitivity pattern for appropriate treatment of children with UTI in that locality. Further early diagnosis and institution of definitive treatment is of paramount importance as delay may lead to long term sequelae like hypertension and chronic kidney disease.

Conflict of Interest: The authors declare that there is no conflict of interests regarding the publication of this paper.

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Ethical Clearance: Since it is a retrospective observational study from analysis of hospital records only, without any interventional work and without any disclosure of patients' identity, thus having no ethical issue; ethical clearance was not considered.

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Effectiveness of Nutritional Ball among Adolescent Girls with Anemia in Selected Government Schools, Greater Noida

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ABSTRACT

Anemia continues to be a major public health problem among children in many parts of the world and Nutritional ball helps to increase the Hemoglobin level among the adolescent girls. **Objectives**: To assess the effectiveness of nutritional ball on hemoglobin level among the adolescent girls in experimental group and to find out the association between the post-intervention hemoglobin level among adolescent girls with the selected variables in experimental group. **Design:** Quasi Experimental (Non-Randomized control group design). In Post- intervention time in Experimental group 23.333% of them were not having anemia, 50% of them were having mild anemia, 26.667% were having moderate anemia and none of them were having severe anemia. **Clinical application:** Nutritional ball can be administered to the adolescent girls having less Hemoglobin level than normal to prevent anemia. Nutritional ball is considered as the most essential home remedy for anemia, because of its high iron content, cost effectiveness and easiness to prepare**. Conclusion**: Nutritional ball administration is effective to improve the Hemoglobin level among the adolescent girls.

Keywords: *Anemia, adolescent girls, nutrition ball, hemoglobin.*

INTRODUCTION

Adolescence is the period that starts from puberty till the completion of sexual maturation[1] According to UNICEF, 2012, adolescent population (10-19), is, 238562.5 i.e. 19% of total population in India among which 60 to 70 percent of the adolescent girls are anemic[2]

Adolescents gain 30% of their adult weight and more than 20% of their adult height between 10-19 years, which we call as the growth spurt. The prevalence of anemia is disproportionately high in the developing countries, due to poverty, inadequate diet, worm infestations, pregnancy/lactation and poor access to the health services[3]. In teenagers, anemia is more than just being pale and tired. It can affect their development and school performance. Iron deficiency can cause less attention, alertness and decrease in learning among adolescents. Adolescent girls with chronic illness, heavy menstrual blood loss (>80 ml / month) or who are underweight or malnourished are at increased risk for iron deficiency and should be screened during health supervision or clinic visits. Overweight and obese children also appear to be at increased risk for iron deficiency and should undergo screening[4].

WHO estimates that 27 percent of adolescents in developing countries are anemic; the Inter National Centre of Research for Women (ICRW) studies documented high rates in India (55 percent), Nepal (42 percent), Cameroon (32 percent) and Guatemala (48 %) respectively.

WHO lists iron deficiency (ID) as one of "Top Ten Risk Factors contributing to death. Iron deficiency anemia (IDA) is more common in South Asian countries including, India, Bangladesh and Pakistan than anywhere else in the world[5].

Adolescent girls are particularly prone to iron deficiency anemia because of the increased demands of iron by the body. This anemia not only affects the present status of health of the adolescent girls, but also shows a deleterious effect when these girls become the future mother. A satisfactory hemoglobin status at the

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time of conception results in safe pregnancy and healthy child birth. This could be attained only when the status of hemoglobin is monitored and improved in adolescent stage itself. According to 2014 census report of India, Uttrakhand is leading on having 91.1% prevalence of anemia whereas Uttar Pradesh is on second by having 90.9%[6].

A one year cross sectional study was conducted in Uttar Pradesh to find out the prevalence of anemia among rural school going adolescents and to identify the associated factors. They took 900 school going adolescents using multistage sampling technique. A structured schedule was used to collect the information. Chi-square test was applied to analyze data using SPSS software. On analysis of data, it was found that, the prevalence of anemia was higher in adolescents in age group 10-14 years (59.58%) as compared to 15-19 years age group (57.06%). It was significantly higher among females (65.11%) as compared to males (54.67%), (p=0.002). The prevalence of anemia was found to be higher among Muslims (62.04%), adolescents belonging to socio-economic class III (78.89%) and belonging to joint families (59.63%).[7]

A cross-sectional survey was executed among 400 female school students in the age group of 13-17 years in Chennai. The socio demographic details and anthropometric measurements were obtained. Hemoglobin was estimated using cyan method. Statistical analysis was done using IBM SPSS (Statistical Package for the Social Sciences). The results showed that the prevalence of anemia was found to be 78.75% among school students. Chi-square statistics shows significant association ($p<0.05$) of anemia with the type of family, socioeconomic status and dietary pattern. In this study 42.5% of girls with BMI<18 were found to be anemic.[8]

A cross-sectional study was conducted to determine the prevalence of iron deficiency anemia among adolescent school girls aged 14-20 years from 20 different high schools located in three educational areas of Kermanshah, Western Iran. Around 57.3% of anemic girls were iron deficient. The mean levels of hemoglobin (Hb), hematocrit (Hct), mean corpuscular volume (MCV), mean cell hemoglobin (MCH) and mean cell hemoglobin concentration (MCHC) in study of adolescent girls were found to be much lower. In conclusion, regarding the detrimental long-term effects and high prevalence of iron deficiency, iron deficiency anemia and anemia in Kermanshah, Western Iran its prevention could be a high priority in the programs of health system of the country and supplementation of a weekly iron dose was recommended.[9]

A study on prevalence of Anemia was conducted among adolescent patients of rural Mathura, U.P., India. They had retrospective analysis of heamogram reports of adolescents of out patient department, investigated at laboratory during months of June & July 2016. Hemoglobin and Complete Blood Count was done on automated hematology analyzer XP series: XP-100. The result showed that total adolescent patients were 85 (50 boys & 35 girls) out of 759 patients investigated. Based on hemoglobin estimation, prevalence of anemia was 70.50%. Maximum number of anemic adolescents were in age group of 14 . Distribution of iron deficiency anemia was slightly more in adolescent girls' i.e.71.43% than adolescent boys i.e. 70.0%.[10]

An experimental study was done on Government Higher Secondary School at Thaiyur and Chenji in Villupuram District. There were 30 adolescent girls in experimental and Control group selected by Probability Simple Random Sampling technique. Level of anemia was measured by Sahli's hemoglobinometer. The result had shown that out of 60 samples, the level of Hemoglobin in pre-test among adolescent girls in Experimental and control, both group had 100% Moderate anemia. On Post-test level of Hemoglobin of adolescent girls in Experimental group 18(60%) of them were having normal hemoglobin and 12(40%) of them were having mild anemia. In control group 0(0%) of them were in normal, 10 (33%) of them were having mild anemia and 20(66.66%) of them were having moderate anemia. The unpaired 'test' value 9.45, table value 2.00 at ($P<0.05$) level of significance showed the significant effectiveness of Hemonutri ball on increasing the Hemoglobin level.[11]

The investigator during her posting to the community area of Greater Noida, observed that there was a high prevalence of anemia in the adolescent girls of government schools. Investigator came across adolescent girls with unexplained lethargy and paleness, which was being assessed and diagnosed as iron deficiency anemia. Considering the magnitude of the problem, the investigator was motivated to introduce the dietary intake of iron supplement in the form of nutritional ball with the low cost available materials among adolescent girls for a period of time to improve

their level of hemoglobin.

OBJECTIVES OF THE STUDY

- To assess the level of Hemoglobin in control and experimental group among adolescent girls.
- To assess the effectiveness of nutritional ball on hemoglobin level among the adolescent girls in experimental group.
- To find out the association between the post-intervention hemoglobin level among adolescent girls with the selected variables in experimental group.

Hypotheses

- H_{01}-There will be a difference between the mean pre intervention and post intervention score of nutritional ball on Hemoglobin level among adolescent girls in experimental group.
- H_{02}–There will be significant association between mean post intervention score of nutritional ball on Hemoglobin level with the selected variables.

MATERIALS AND METHOD

Research approach used was Quantitative research approach

Research design used was quasi experimental design

Sample Size:

60. (30 control and 30 experimental).

Criteria For Sample Selection:

Inclusion Criteria:

- Adolescent Girls studying in selected government Schools of Greater Noida.
- Who are within the age of 13 to 16 years.
- Adolescent children whose Haemoglobin level is equal or less than 11 mg/ dl.

Exclusion Criteria:

- Who are not interested to participate in the study.
- Who are not available during the time of data collection.
- Girls who were menstruating at the time of data collection.

TOOLS OF THE STUDY

Section A-Demographic variables such as age of adolescent girls, educational status, religion, type of family, family monthly income, dietary pattern, age of menarche, regular menstruation, flow of bleeding during menstruation and educational status of mother was assessed.

Section B- Hemoglobin was tested in the laboratory.

Classifying the subjects according to the degree of anemia

Degrees of anemia

The classification of anemia as recommended by WHO (1992) and

National Institute Of Nutrition (NIN,1986) was followed for categorization of the subjects.

Level of Anemia	Score
No Anemia	>12 mg/dl
Mild Anemia	11-11.9mg/dl
Moderate anemia	8-10.9mg/dl
Severe anemia	<than 8mg/dl

Section C- Administration of nutritional ball.

Data Collection

The study was conducted from 5-03-2018 to 3-04-2018.Adolescent girls (n=60) aged between 13-16 years were selected by Non-Probability Purposive sampling technique at Government School, Tugalpur, Greater Noida, Uttar Pradesh.

Pre-test:

Adolescent girls aged between 13-16 years were divided into 2 groups as experimental group and control group. Informed consent was obtained from the adolescent girls who fulfilled the criteria. On the 1st day the hemoglobin level was checked for both the schools

among the adolescent girls based on Non-Probability Purposive sampling technique. The girls with the Hemoglobin level between 8-11.9mg/dl) were taken as samples.

Implementation:

47 grams of Nutritional ball was given daily for about 30 days for experimental group in morning, day and evening time. All 30 adolescent girls use to consume Nutritional ball in the presence of the investigator.

Post-test:

After 30 days, Hemoglobin level was checked for both the groups and the values were recorded.

Method of Data Collection

Phase I: To identify the accurate level of Hemoglobin level among adolescent girls with iron deficiency anemia by blood analysis.

Phase II: Nutritional ball was given to the adolescents whose Hemoglobin level was 11.9 or less than in experimental group.

Phase III: After a period of one month the blood was assessed for the level of Hemoglobin in both control and experimental group.

Ethical Consideration:

Informed written consent was obtained from the Head master of the school prior to the collection of the data.

Written consent was obtained from the adolescent girls to consume the nutritional ball.

Ethical clearance certificate was obtained from the ethics committee

The steps for analysis:

- The data will be organized in master sheet and tabulated.
- Using window Excel sheet data and percentage of the analysis of demographic data will be done.
- Mean, mean percentage and standard deviation of control group & experimental group.
- Post- test hemoglobin was compared by control group using mean difference.
- Association of hemoglobin level with selected demographic variable was done using chi-square test.

FINDINGS

Section A:

Distribution of demographic variables of the adolescent girls in experimental group and control group.

Section B:

Hemoglobin level of the adolescent girls in Experimental and Control group.

Section C:

Effectiveness of Nutritional ball after administration to the adolescent girls in Experimental group.

Section D:

Association between post-test level of Hemoglobin among adolescent girls with their selected variables in Experimental group.

Section – A: Distribution of Samples According To Their Demographic Variables

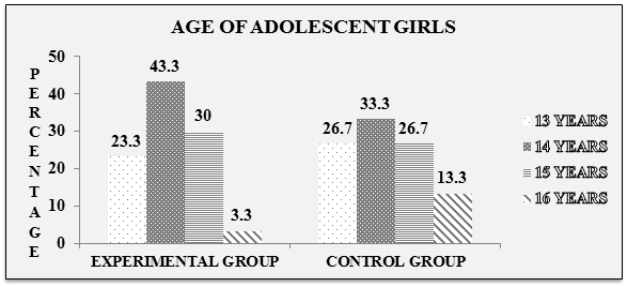

Figure No. 1: Diagram showing the percentage distribution of Experimental and Control group according to the Age of the Adolescent girls.

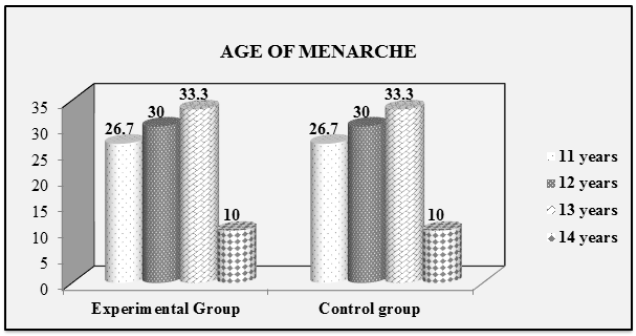

Figure No. 2: Diagram showing the percentage distribution of Experimental group and Control group according to the Age of Menarche.

Section-B: Assess The Hemoglobin Level of The Adolescent Girls In Experimental And Control Group

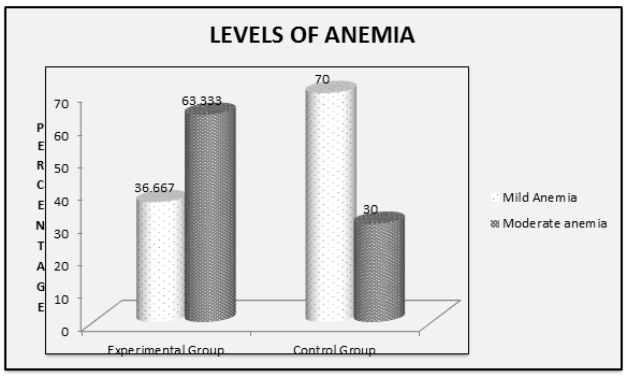

Figure No. 3: Diagram showing percentage distribution of the Pre-intervention Hemoglobin level of adolescent girls in experimental and control group.

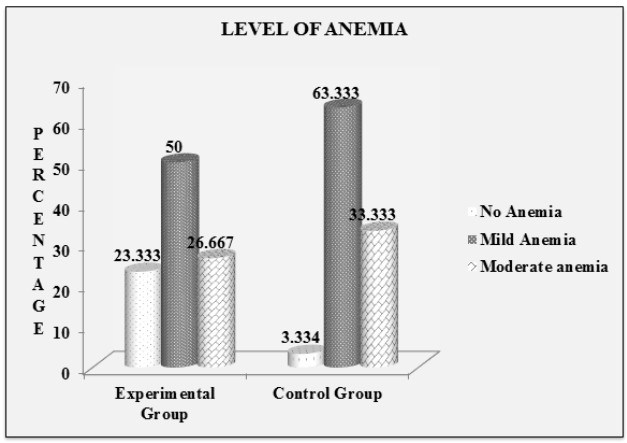

Figure No. 4: Diagram showing the distribution of post-intervention level of hemoglobin of the adolescent girls in Experimental and Control group

Section C:

To Evaluate The Effectiveness of Nutritional Ball After Administration On The Adolescent Girls In Experimental Group.

Table No. 1

Test	Mean	Standard Deviation	t Value	P value
Pre-test	10.6133	1.04312	4.649	0.001**
Post-test	11.0553	1.021340		

Pre-intervention and post-intervention scores of hemoglobin of the adolescent girls in experimental group

Above table shows that the average pre-intervention scores of the hemoglobin level among adolescent girls in experimental group is 10.6133(SD 1.04312) and the post- intervention mean score is 11 (SD 1.021340).The t value is 4.649. This shows that there is a significant (at P<0.01 level) relationship between pre-intervention and post-intervention score on hemoglobin level among adolescent girls in the experimental group.

Table No. 2

Test	Mean	Standard Deviation	t Value	P value
Pre-test	11.0100	0.69399	0.682	0.501
Post-test	11.0200	0.69798		

Pre-intervention and post-intervention scores of hemoglobin of the adolescent girls in control group

This shows that there is no significant (at P>0.01 level) relationship between pre-intervention and post-intervention scores on hemoglobin level among adolescent girls in control group.

Section D:

Chi- square values were calculated to find out the association between post intervention scores on the levels of Hemoglobin in experimental group among adolescent girls with their variables.

It reveals that there was no significant association between post-intervention level of hemoglobin of Experimental group with any of the variables (P>0.01). It seems that Nutritional ball on

Hemoglobin level was effective to the experimental group irrespective of their variables.

DISCUSSION

Findings related to the level of Hemoglobin among adolescent girls in both group.

a) Experimental group for level of hemoglobin.

Pre-intervention

36.667 % of them were having mild anemia and 63.333 % of them were having moderate anemia.

Post-intervention

23.333% of them were not having anemia, 50% of them were having mild anemia, 26.667% were having

moderate anemia and none of them had severe anemia.

b) Control group for level of hemoglobin.

Pre-intervention

70%of them were having mild anemia and 30%of them were having moderate anemia

Post-intervention

3.334% of them were having no anemia, 63.33% of them were having mild anemia and 33.33% of them were having moderate anemia.

CONCLUSION

From the findings of the study it can be concluded that, most of the adolescent girls in experimental group fall at the age of 14 years and were from 7th standard. Most of the girls from experimental group were from nuclear family, the family monthly income was less than Rs.5000, and they were having mixed dietary pattern. Most of them attained menarche at the age of 13 and had irregular menstruation as well moderate flow of bleeding.

Most of the adolescent girls in the control group were of the age 14 and were from 8th standard. All the girls were from Hindu religion. Most of the girls from control group were from joint family and family monthly income was less than Rs.5000. They were having equal mixed and vegetarian diet pattern. Most of them attained menarche at the age of 13 and had irregular menstruation as well moderate flow of bleeding.

The administration of nutritional ball was effective in improving level of Hemoglobin among adolescent girls in experimental group.

Ethical Clearance- was obtained from the university registered ethics comittee

Conflict of Interest – None

Source of Funding – Sharda University research committee had funded Rs.30000 for this project.

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Analysis of Heavy Metal Distribution and Content in Coastal Area of Makassar, Indonesia

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ABSTRACT

Coastal waters of Makassar have important roles not only for the fishermen but also for businessmen and tourisms development. Based on landscape plan of Makassar, coastal waters of Makassar were designated for tourism development. In conjunction with those designations quality of the environment has to be keeping in order maintaining the environment was still in a good condition. Therefore, a research on heavy metal content in the waters is necessary to be conducted by comparing the value with the environmental standard quality. Research on heavy metal (Hg, Cd, Pb and Cu) contents as a standard for water quality because of their toxicity on organism live in a certain period of time. The objective of this research is to examine heavy metal content in Coastal waters of Makassar for fisheries and tourism purposes. In coastal waters of Makassar and several river mouths, water samples were taken with ten replications. In Makassar waters, at the beginning of this research sampling location was designated based on land and water activities. Samples was taken by using sampling bottle in the area of coastal waters of Makassar such as in the river mouth of Tello, Paotere Port, river mouth of Jeneberang, TanjungMerdeka, and Losari beach with using composite sampling methods.Five locations of sampling were designated based on 1) purpose of sample collection, 2) water resource would be collected, 3) water flow models would be sampled, and 4) water body flow model would be sampled. Based on the result of this research, Cd content was 0,083 – 0,129, Pb content was 0,434 – 0,838 and Cu content was 0,027-0,39 mg/l). Heavy metal content (Cu, Pb and Cu) in the coastal waters of Makassar was still in save condition and still below standard quality based on Kepmen-LH 51/2004.

Keywords: *Heavy metal, coastal waters Makassar.*

INTRODUCTION

The development of cities and industrial progress in Indonesia is increasing rapidly which will indirectly be followed by additional waste and other environmental problems [1-4]. Other diseases also occur such as infectious diseases such as Tuberculosis and Diarrhea and noninfectious diseases such as stroke and traffic accident [5,6]. Improper city management and poor industrial waste disposal processes and household waste can cause pollution and ultimately have a negative impact on the environment [7,8].

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Pollutants that enter the environment will react with one or more environmental components [9,10]. Changes in environmental components physically, chemically and biologically as a result of pollution materials bring about changes in environmental values called quality changes [2]. Waste containing pollutants will change the quality of the environment if the environment is unable to restore its condition according to the carrying capacity it has. Therefore, it is important to know the nature of the waste and the pollutant components contained.

Initially industrial waste and household waste entering the sea either through rivers or sewers has a low pollutant power so it is not dangerous, but if the waste is more and more and exceeds the carrying capacity of the environment, it will slowly cause serious pollution to the marine environment [11-14].

The sea is a place of life for various organisms that are very influential in the aquatic environment [15]. Disposal of liquid waste from business activities, domestic waste, garbage or sewage that can continuously cause pollution to the sea is increasing, without the opportunity to purify them due to reduced or lost oxygen which is needed by the habitat of sea water quality [16].

The coastal area of Makassar city is one of the industrial cities that is growing very rapidly where the population activities in this area are increasing along with the development of the economy [17]. Makassar, which is located on the coast, cannot be separated from various waste problems, both industrial waste, household waste and sea transportation which will eventually be wasted into the sea.

The waters around the Makassar coast are waters that are susceptible to being penetrated by various pollutants sourced from household waste inputs and industrial waste from sewage disposal and canals which lead to the Makassar coastal waters. Seeing these conditions that continue to take place, research is needed on the presence of heavy metals as contaminants in the coastal waters of Makassar.

The purpose of this study was to determine the distribution and content of heavy metals in the waters of Makassar Beach.

RESEARCH METHOD

Research Site

This research was carried out in the coastal waters of Makassar. Sample analysis was carried out at the Maros Soil Installation Laboratory.

Tools and materials

Tools and materials used are boats, pipettes, sample plastic bottles, compass geology, computer devices, atomic absorption spectrophotometers, global positioning systems.

Water Quality Sampling Techniques

Determination of observation stations

In the coastal areas of Makassar City and rivers, samples were taken in each river and carried out 10 times. In coastal areas, research begins with determining the location of sampling conducted with consideration to represent activities on land, and activities in the waters. Water sampling was carried out using sample bottles in five coastal areas, namely the Tello River estuary, Paotere Port, Jeneberang River estuary, Tanjung Merdeka, and Losari Beach with composite sample technique. The sampling location was chosen / determined intentionally (purposive sampling). The determination of these five sampling locations is based on 1) the purpose of sampling, 2) the type of water source to be sampled, 3) the pattern of water flow to be sampled and 4) the flow pattern of water bodies to be sampled, specifically surface water.

Water Sampling

Water samples are taken in a composite using a sampling tool. Water samples are put in a bottle and labeled with a sample of water inserted into the cool box to be brought to the laboratory for analysis purposes. The time of sampling water together with the time of taking some supporting parameters such as temperature, pH, and brightness. This sample sample is then preserved with concentrated H2SO4 before analyzing it in the laboratory.

Position (latitude - longitude) of the sampling location or each observation station is determined using GPS (global positioning system). Water quality data collection was carried out for six months.

RESULTS AND DISCUSSION

Heavy metals in natural waters have very low levels, and will increase if there is pollution by pollutants containing heavy metals [18,19]. Heavy metal materials, Hg, Cd, Pb, and Cu, are hazardous materials because they are toxic for the life of organisms within a certain period of time. Factors affecting the toxicity of heavy metals in water according to Bryan (1976), are the form of these heavy metal compounds, both organic, inorganic, neutral, and other metals. One of the properties of heavy metals is difficult to destroy naturally and tends to accumulate in natural food chains through a biomagnification process.

Cadmium (Cd) is a silver-white metal, soft, shiny, insoluble in alkaline, easy to react, and produces potassium oxide when it is pressed. Cd is commonly found in combination with chlorine (Cd chloride) or sulfur (Cd sulfite). Cd has an atomic number of 40, atomic weight of 112.4 g / mol, melting point of 3210C, and boiling point of 7670C. The range of Cd at the

study location. The range of Cadmium (Cd) at the study location was between range (0.083 - 0.129 mg / L). It can be seen that the presence of Cadmiun in the research location is slightly above the water quality standard according to Minister of Environment Decree No. 51 of 2004, namely Cd = 0.05 - 0.1 mg / L. (as shown in Figure 1.)

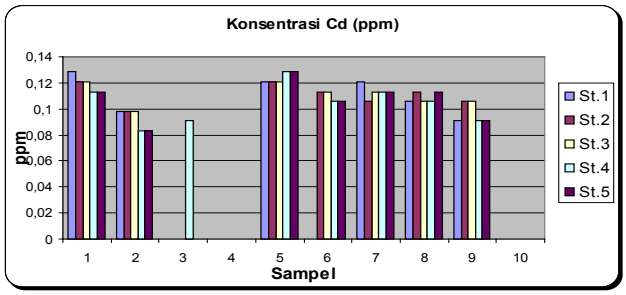

Figure 1. Cd concentration at the study site

Lead (Pb) is a heavy metal that is naturally present in the earth's crust, but lead also comes from human activities [20]. Pb has a low melting point, is easy to form, has active chemical properties, so it can be used to coat metal so that no arising will occur. Pb is a shiny, bluish gray soft metal that is easily purified from mining. Lead melts at 3280C (6620F); boiling point 17400 C (31640 F); and has a gravity of 11.34 with an atomic weight of 207.20. The range of Pb at the study location as shown in Figure 2. ranges from (0.434 - 0.838 mg / L). This can be seen that the presence of Pb at the study location is still below the standard quality standard of the Minister of Environment Decree No. 51 of 2004 (0.1 - 1.0 mg / L).

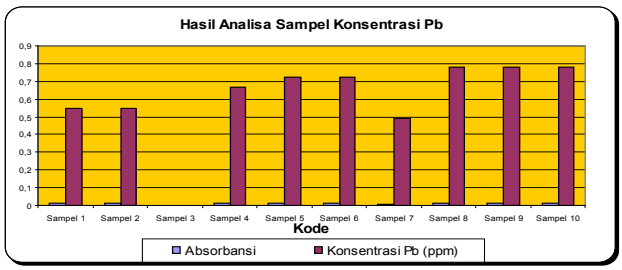

Figure 2. Concentration of Pb values at the study location

Kuprum or copper (Cu) has a cubic crystal system, which is physically yellow and when using a microscope it will be brownish to grayish. Cu is a metal group, red, and easily deformed. Physically, heavy metal Cu is classified into good conductor metal so that Cu is widely used in electronics. The range of Cu (Figure 3.) in the study location is in the range (0.027 - 0.039 mg / L) the presence of Cu in the study location is still below the standard quality standard of Minister of Environment Decree No. 51 of 2004 (2.0 - 3.0 mg / L) This indicates that the presence of Cu in the research location is still permissible.

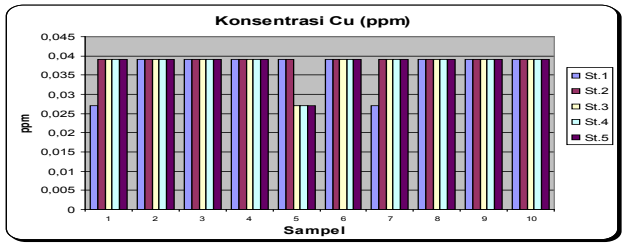

Figure 3. Cu concentration at the study site

Figure 4 explains that the relatively high Pb at the study site is thought to originate from anthropogenic activities, namely from the burning of fuel, both carried out on land (transportation and industry) and from activities in the sea (transportation). The same condition also occurred the concentration of Cd, namely Cd which entered the waters allegedly originating from industrial activities. In contrast to Pb and Cd, Cu concentrations in waters are relatively low. This is because Cu is needed for the formation of haemocianin in invertebrate animals especially from phyllum krustase.

CONCLUSION

This study concludes that the content of Cd in the coastal waters of Makassar is in the range of (0.083 - 0.129 mg / L), Pb content in the study location ranged from (0.434 - 0.838 mg / L) and Cu ranged from (0.027 to 0.039 mg / L), The content of heavy metals such as Cd, Pb and Cu in the coastal areas of Makassar coastal waters are still safe and are still below the standard quality standards, based on Minister of Environment Decree No. 51/2004.

Conflict of Interest: None

Source of Funding : Nil

Ethical Clearance: The study was approved by the Institutional Ethical Board of the Hasanuddin University, Makassar.

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Knowledge of Critical Care Nurses on Cardiac Medications-Need For Reinforcement Workshop

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ABSTRACT

Cardiovascular disease remains a major health problem in today's society. It is estimated that more than 6 million people have a history of myocardial infarction and/or angina. Hypertension is another major health problem affecting at least 50 million people in the United States. Due to the high prevalence of these conditions, many patients will be taking one or more cardiac medications. The present study was carried out with the objectives to assess the knowledge of critical care nurses on cardiac medications and to find out the association between the qualification, clinical experience and the previous experience of attending cardiac emergencies. The research approach used for this study was survey approach. Descriptive survey design was adopted. About 108 critical care nurses were selected using convenient sampling technique. The data collection instruments were: Demographic Proforma and Structured knowledge questionnaire on cardiac medications. Content validity of the tools was established by giving it to five experts in the field of nursing, general medicine cardiac medicine and pharmacology. Modifications were made according to experts' suggestions. The tools were pretested before use among five critical care nurses. Reliability coefficient of Structured knowledge questionnaire was found out by using Split half technique and the tool was found reliable (r=0.806). Descriptive statistics was used to analyze the data. The significant findings of the study were: Majority 74(68.5%) of the participants were between the age group of >25-40 years, Majority 85 (78.7%) were females. About 65 (60.2%) were with the GNM qualification, majority 62(57.4%) were with the clinical experience of >1-5 years and 35 (32.4%) mentioned that they had attended cardiac emergencies during their clinical experience. It was found that the majority 47 (43.5%) of the participants shared equally good and average knowledge on cardiac medications. It was found that there was no significant association between the knowledge of critical care nurses on cardiac medications and education (χ^2=2.295,p=0.317) and clinical experience(χ^2 =8.551,p<0.200).

Keywords: *Knowledge, critical care, cardiac medications, reinforcement workshop.*

INTRODUCTION

Non communicable diseases are increasing alarmingly at the global level. It has been anticipated that by 2020, there would be an 11% rise in cardiovascular deaths in India and hypertension is one of the major contributing factor for the same.[1] In the hospital setting, emergencies typically occur in emergency departments (EDs) and intensive care units (ICUs). But many also take place in progressive care units or general nursing units. And when they do occur it can cause marked anxiety for nurses especially those unfamiliar or inexperienced with the drugs used in these emergencies.[2,3] Nurses are expected to be mainly responsible for the efficient and effective management of patient care services. In the health care team nurses play a pivotal role in caring for patients. They are considered as the frontline case managers as they are the first ones to receive any emergencies arriving into their units. It is very important that they need to know the drugs in the crash cart. More

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importantly, it must be ensured that they are adequately trained in cardiac medications which is a crucial step in a patient's survival in cardiac emergencies.It is very important that every nurse working in an intensive care unit is able to think critically, analyze the situation and know the medication before administering. They should try to answer the 'WH' questions (why, what, when and how) in relation to the drugs which they are administering. That can really bring a great change in the health care settings and ultimately the nurses will be able to fetch a tremendous satisfaction seeing patients getting stabilized out of the emergencies. Lack of drug knowledge can cause medication errors. Regardless of what is ordered, nurses need to be able to recognize when a prescribed dose of a medication is too high or low. With each medication administration, nurses are accountable for knowing what possible side effects are to be monitored. The rate of preventable and potential adverse drug events is high in ICUs compared with non-ICU. [4,5]

Patients' safety is increasingly recognized as essential in the practice of intensive care medicine. Patients in intensive care unit require high intensity care and may be at high risk for iatrogenic injury. Individuals have right to safe and effective quality health care. Patients in ICU are prescribed twice as many medications as non-ICU patients. The critical care safety demonstrated that 78% of serious errors in ICU patients are attributable to medication. A compassionate, knowledgeable, and skilled nurse caring for the patient in a critical care unit is an asset in the achievement of positive outcomes for the patient.[6,7]

MATERIALS AND METHOD

The critical care nurses (108) were selected for the study conveniently. The research approach used for this study was survey approach with descriptive survey design. Objectives of the study were to assess the knowledge of critical care nurses on cardiac medications and to find out the association between the qualification,clinical experience and the previous experience of attending cardiac emergencies.The data collection instruments were: Demographic Proforma, Structured knowledge questionnaire on cardiac medications. The Knowledge questionnaire had 30 items and the scores were arbitrarily classified as poor (0-10), average (11-20) and good (21-30) knowledge. Content validity of the tools was established by giving it to five experts in the field of nursing, general medicine cardiac medicine and pharmacology. Modifications were made according to experts' suggestions. The tools were pretested before use among five critical care nurses. Reliability coefficient of Structured knowledge questionnaire was found out by using spearman brown prophecy formula and the tool was found reliable (r=0.806).The ethical clearance was obtained from the Institutional Ethical Committee (IEC) before proceeding for data collection. Written informed consent was obtained from the participants before collecting the data. The tools were self-administered.

RESULTS AND DISCUSSION

The findings of the study show that majority 74(68.5%) of the participants were between the age group of >25-40 years, Majority 85 (78.7%) were females. About 65 (60.2%) were with the GNM qualification, majority 62(57.4%) were with the clinical experience of >1-5 years and 35 (32.4%) mentioned that they had attended cardiac emergencies during their clinical experience (Table 1). Majority 47 (43.5%) of the participants shared equally good and average knowledge on cardiac medications. The poor knowledge among 13% of the participants could be because 66% had not attended any cardiac emergencies (Table 2). The study also revealed that there is no significant association between the knowledge of critical care nurses on cardiac medications and education (χ^2=2.295,p=0.317), clinical experience(χ^2 =8.551,p=0.200) and attending cardiac emergencies(χ^2 =3.188,p=0.203) (Table 3).

The above findings are supported by the study conducted by Devi, Mayya, Bairy, Mohan, Anjali, Aswathy et al on Knowledge of cardiac emergency drugs and its application in clinical practice among undergraduate nursing students of selected college of Udupi, Karnataka. The objectives of the study were to compare the level of knowledge and application of knowledge on cardiac emergency drugs among third and fourth year B.Sc. nursing students and to compare the opinion of fourth year and third year B.Sc. nursing students in learning pharmacology. The data was collected from 120 sample using descriptive survey approach. The result showed that 61.66% of the third year and 40% of fourth year B.Sc. Nursing students have poor level of knowledge as well as 60% of fourth year and 80% of third year did not have adequate theory knowledge of cardiac emergency drugs which clearly

indicates that the students require further input into the learning of cardiac emergency drugs for comprehensive care of cardiac patients.[8]

The findings of the present study is also supported by the study conducted by Anupriya on study to assess the knowledge about selected cardiovascular drugs among cardiac nurses. The study was conducted among fourty cardiac nurses from one of the Medical Sciences institute, Trivandrum. Convenient sampling technique was used for selecting the sample. A self-prepared questionnaire was used. Study showed that cardiac nurses knowledge on selected cardiovascular drugs is above average (10.75/15).There was no statistically significant difference the mean knowledge score and age, year of experience, place of work and training programme attended.[9] The study by Suchithra GR among cardiac ICU nurses in Thiruvanathapuram, showed that out of 30 staff nurses, 17 (57%) had their knowledge on cardiac drugs between 61-80%. [10]

CONCLUSION

The result showed that there was only 14 (13%) were with the poor knowledge on cardiac medications. So the researcher did not feel the need for conducting the reinforcement workshop on cardiac medications. This is been discussed with the nursing administrator at the hospital and is considered as an important area which need to be emphasized in the plan as an ongoing activity in the Continuing Nursing Education Programme. Nurses' being knowledgeable in the handling and usage of cardiac medications is the cornerstone for the care of patients in critical care units. As there are many new drugs been added every year to the pharmacopedia, it is very important for the nurses to keep abreast with the advances in the field of medicine.

Table 1: Sample characteristics of critical care nurses in terms of frequency and percentage

N=108

Sample Characteristics	Frequency (f)	Percentage (%)
Age in years		
< 25	27	25
>25-40	74	68.5
>40	7	6.5
Gender		
Male	23	21.3
Female	85	78.7
Education		
GNM	65	60.2
BSc (N)	43	39.8
MSc (N)	0	0
Clinical experience in years		
< 1	24	22.2
>1-5	62	57.4
>5-10	13	12
>10	9	8.3
Attending Cardiac emergencies		
Yes	36	33.3
No	72	66.7

Table 2: Frequency and percentage distribution of knowledge scores of critical care nurses on cardiac medications. N=108

Range of knowledge scores	Frequency (f)	Percentage (%)
Poor (0-10)	14	13
Average (11-20)	47	43.5
Good (21-30)	47	43.5

Maximum possible score is 30.

Table 3: Chi-square values computed between the knowledge scores of critical care nurses and selected variables N=108

Variables	Good	Average	Poor	Chi-square (χ^2)Values	df	P Value
Education						
GNM BSc(N)	32 15	26 21	7 7	2.295(2)	2	0.317
Clinical experience in years						
< 1 1-5 5-10 >10	9 25 6 7	9 30 6 2	6 7 1 0	8.551(6)	6	0.200
Attending cardiac emergencies						
Yes No	36 11	28 19	9 5	3.188(2)	2	0.203

p<0.05 *Significant

Ethical Clearance: Ethical clearance was sought from institutional ethical committee (IEC No.410/2014). Informed consent from the participants was obtained after explaining the purpose of the study and assuring confidentiality of information.

Source of Funding: Self

Conflict of Interest: Nil

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Knowledge on Practice of Urinary Catheter Care and Compliance to Urinary Catheter Care Guidelines- A Hospital based Study

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ABSTRACT

Background: Catheter associated urinary tract infections are the leading cause of secondary health care-associated bacteremia. An infection that involves any of the organs or structures of urinary tract infection including the kidneys, urethra, bladder and ureter is called as urinary tract infection. About 75% of urinary tract infections acquired in the hospital are because of the urinary catheters. Prolonged use of indwelling urinary catheter is one of the main risk of catheter associated urinary tract infection.

Objective: To assess the knowledge on practice of urinary catheter care and compliance to urinary catheter care guidelines by the staff nurses.

Materials and Method: Quantitative approach with descriptive survey design was used for the study. Staff nurses available during data collection and willing to participate were included. Purposive sampling technique was used to recruit the participants to assess the knowledge. By concealed observation practices of urinary catheter care were made to assess the compliance.

Results: Majority 89(82.4%) of the participants had average knowledge , 18(16.7%) had good knowledge on prevention of catheter associated urinary tract infections .There was maximum noncompliance to the procedural steps while performing urine specimen collection , removal of urinary catheter and maintenance of urinary catheter.

Conclusion: Nurses have to be aware of hospital policies and CDC guidelines in carrying out procedures like urinary catheter insertion, collection of urine specimens and maintenance of indwelling urinary catheter. Compliance of staff nurses is vital in reducing and preventing the occurrence of health care associated infection.

Keywords: *knowledge on practice, urinary catheter care, compliance to urinary catheter care guidelines.*

INTRODUCTION

Health care-associated infection(HCAI), also referred to as " nosocomial" or "hospital" infection, is that which is occurring in patient during the process of care in the hospital or health care facility which was not present or incubating at the time of admission[1].

Catheter associated urinary tract infections (CAUTI) are the leading cause of secondary health care-associated bacteremia. An infection that involves any of the organs or structures of urinary tract infection including the kidneys, urethra, bladder and ureter is called as urinary tract infection. About 75% of urinary tract infections acquired in the hospital are because of the urinary catheters. Prolonged use of indwelling

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urinary catheter is one of the main risk of catheter associated urinary tract infection .Catheter associated urinary tract infection is caused by many organisms. The frequent pathogens associated are E.Coli(21.4%), Candida spp (21%),Enterococcus(14.9%), Pseudomonas Aeruginosa(10%), Klebsiella Pneumoniae(7.75) and Enterobacterspp(4.15).[2,8,11]

Urinary tract infections are the 4th most common type of hospital acquired infection with an estimated 93,300 urinary tract infections (UTI) in acute care hospitals in the year 2011[2]. UTIs are accounting for more than 12% of infections reported by acute care hospitals. Research studies shows that when health care facilities, doctors, nurses and care teams are aware of infection problems, it is possible to take specific steps to prevent them. CAUTI can causes a number of complications like cystitis, prostatitis, endocarditis, pyelonephritis, orchitis, septic arthritis, endopthalmitis, meningitis in patients. Yearly 13,000 deaths occur due to urinary tract infection related to urethral catheters[2, 9, 10, 16]. The present study aimed at assessing the knowledge on practice of urinary catheter care and compliance to urinary catheter care guidelines by the staff nurses working at a tertiary care hospital.

MATERIALS AND METHOD

The study was conducted in a tertiary care multi-specialty hospital in southern India among 108 staff nurses. Staff nurses working in the intensive care units were included in the study. The data was collected between 2nd January 2017 and 5th February 2017. After obtaining administrative permission and from Institutional Ethics Committee (IEC No. 748/2016) concealed observation of events such as urinary catheter insertion, urinary catheter removal, urine specimen collection and maintenance of urinary catheter were made. After this the staff nurses in the units were explained about the concealed observation and consent was sort and participant information sheet was given to them. The knowledge was assessed by using structured knowledge questionnaire which consisted of 30 items with domains such as hospital infection control committee guidelines, Centre for disease control guidelines, pathogenesis of catheter associated urinary tract infection. Each item consisted of four options from which participants were asked to choose the right one.

Compliance to different procedural steps of urinary catheter care practices was assessed by concealed observation. Procedures like insertion of urinary catheter, removal of urinary catheter, urine specimen collection, maintenance of urinary catheter were observed using checklist. All the events available during data collection were observed. Confidentiality of study participants was maintained throughout the study.

Non probability Purposive sampling technique was used to assess the knowledge of staff nurses (n=108) on prevention of catheter associated urinary tract infection and for practices maximum number of observations were made by concealed observation.

Data was collected using structured knowledge questionnaire to assess knowledge and practices of urinary catheter care were made observed using observation checklist.

RESULTS AND DISCUSSION

Data was analysed using descriptive statistics. The findings of the study showed that out of 108 participants majority 95 (88%) were between the age group of 20 to 30. Majority 92 (85.2%) were females, 64(59.3%) were GNM qualified and majority 67(62%) were having experience of 1 to 5years.Out of 16 (14.8%) who had attended the training program on CAUTI; 14(13%) expressed having awareness on Evidence Based Guidelines of CAUTI preventive practices (Table 1).

Out of 108 participants, 89(82.4%) had average knowledge and only 1(0.9%) had poor knowledge on practice of urinary catheter care (Figure 1). The results of the study conducted by Prasanna at Nellore,India in 2015 on Knowledge regarding catheter care among 30 staff nurses showed that 46.7% had adequate knowledge and 20% had inadequate knowledge.[3] The findings of the study done by Opina & Oducado at Iliolo city in 2014 reported that out of 30 staff nurses 70% had low level of knowledge and 30% had average knowledge.[4] Study conducted by Purbia, Vyas, Sharma & Rathore among staff nurses working at Geetanajli Hospital Udaipur, Rajasthan India showed that 58.88% belonged to inadequate knowledge and 12.22% belonged to moderate knowledge.[5]

With regard to practices of urinary catheter insertion, out of 19 events observed there was noncompliance to procedural steps in the areas of hand hygiene before catheter insertion with soap and water though few of them used hand rub. Perineal hygiene with antiseptics was

observed in all the events but a single swab was used for multiple strokes 17(89.5%).Compliance was observed in securing the urinary catheter and hanging the urine bag below bladder level (Table2). This finding is supported by a descriptive study which was conducted by Mark Lister & Ryan Michael in 2014 to assess the knowledge and practices of staff nurses regarding infection control practices for indwelling urinary catheters. The findings of the study reported that 40% of staff nurses did not perform hand washing before catheter insertion. It was identified that 66.7 % had poor practices on infection control. Out of 30 staff nurses who were observed for 30 days; handling of sterile equipments was 80%, wearing sterile glove before insertion is 83.3%, perineal care is 3.3%, placement of drainage bag was 100%[4].

Out of 21 observations done; there was noncompliance in the areas of handhygiene, cleaning of port with disinfectant and aspiration of urine with sterile syringe, which was not performed in all the 21 observations. It was observed that urine specimen were collected either by disconnecting continuous drainage system for cultures or directly from urine collecting bag for routine tests (Table. 3). The findings of this study contradicts the findings of the study done in 2016 to assess the knowledge and practice on appropriate reasons in obtaining proper urine cultures and identifying catheter associated urinary tract infection .The results showed that out of 394 staff nurses 78.9% of them reported of collecting urine specimen from port by aspirating while 3.3% reported that urine specimen was collected from the drainage bag or by disconnecting the closed drainage[6].

The findings also showed that with regard to practices of urinary catheter removal there was compliance observed in all events except in the area of routine perineal care 11(91.7%) after the catheter removal (Table 4).With regard to practices of maintenance of urinary catheter, out of 170 observations done noncompliance was observed in the areas of handhygiene before procedure 50(29.41%), cleaning of perineal area with soap and water 20(11.76%),handhygiene after procedure 152(89.41%), securing the catheter 161(94.70%) and maintaining closed drainage system 161(94.70%) (Table. 5). A prospective observational study conducted in 5 general hospitals of Kansai area of Japan reported that the perineal care was given by only 56% of the nurses for the patients with urinary catheter.[7]

CONCLUSION

Healthcare associated infections are a threat to patient's safety. Nurses have a vital role in preventing healthcare associated infections. With developing technologies nurses need to update themselves to face the challenges of dealing with and preventing healthcare associated infections. Nurses have to be aware of hospital policies and CDC guidelines in carrying out procedures like urinary catheter insertion, collection of urine specimens and maintenance of indwelling urinary catheter. Compliance of staff nurses can reduce and also prevent the healthcare associated infection.[12, 14, 17] In the present study majority (82.4%) of the staff nurses had adequate knowledge but there was noncompliance to procedural steps of urinary catheter insertion, urine specimen collection, maintenance of urinary catheter. The study findings has provided a base in finding out the compliance of staff nurses towards practices of prevention of urinary tract infection associated with indwelling urinary catheter. Though the staff nurses had adequate knowledge on prevention of catheter associated urinary tract infection there was maximum noncompliance observed in practices regarding catheter care. The study recommends that nurses need to enhance their knowledge on the hospital as well as CDC guidelines for prevention of urinary catheter care infections so as to be compliant to the procedures.

Table 1: Description of sample characteristics. **N=108**

Sample characteristics	Frequency(f)	Percentage(%)
Age in years 20-30 >30	 95 13	 88 12
Gender Male Female	 16 92	 14.8 85.2

Cont... **Table1: Description of sample characteristics.** **N=108**

Educational qualification GNM B.SC M.SC	 64 44 0	 59.3 40.7 0
Total Years of experience <1 1-5 >5	 10 67 31	 9.3 62 28.7
Attended training programs on catheter associated urinary tract infection Yes No	 16 92	 14.8 85.2
Awareness of EBP on CAUTI Yes No	 14 94	 13 87

N=108

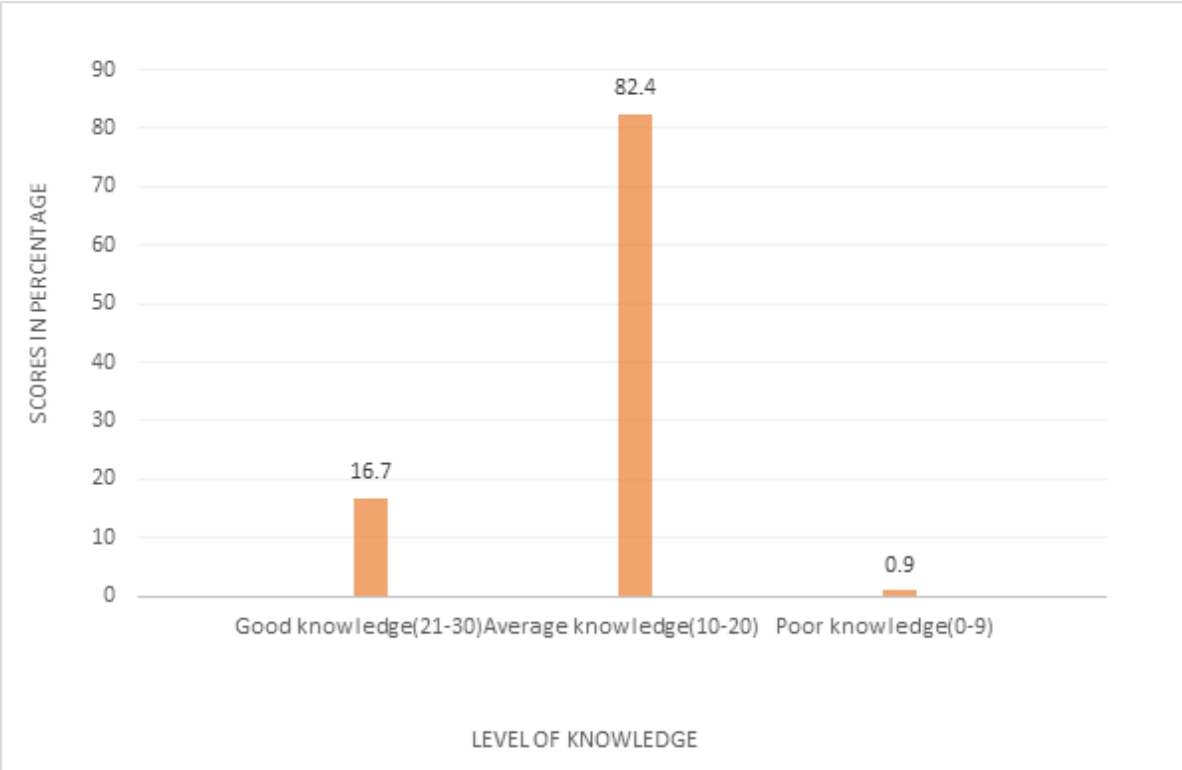

Figure1. Knowledge scores of nurses on prevention of catheter associated urinary tract infections.

Table 2: Frequency and percentage description of infection control practices while inserting urinary catheter N=19

Sl.	Practices	Yes	No	No	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1.	Arrange sterile equipments	19	100	0	0
2.	Position patient supine with knee flexed	19	100	0	0
3.	Performs hand hygiene	0	0	19	100
4.	Don sterile gloves	19	100	0	0
5.	Perform perineal hygiene with antiseptics	2	10.5	17	89.5
6.	Select appropriate catheter(smaller bore)	19	100	0	0
7.	Lubrication	19	100	0	0
8.	Exposes meatus with non dominant hand.	19	100	0	0
9.	Sterile hand to pick up the catheter with the distal end on the sterile field	19	100	0	0
10.	Insert catheter into urethra until urine begins to drain.	19	100	0	0
11.	Inflate the retention ballon with 15ml of water	19	100	0	0
12.	Pull the tube gently to ensure placement	19	100	0	0
13.	Connect the distal end to urine collecting bag	19	100	0	0
14.	Secure catheter tubing on thigh	19	100	0	0
15.	Attach drainage bag below the bladder level	19	100	0	0
16.	Remove gloves and perform hand hygiene	19	100	0	0

Table 3: Frequency and percenatge description of infection control practices during urinary specimen collection. N=21

Sl	Practices	Yes	No	No	
		Frequency(f)	Percentage (%)	Frequency (f)	Percentage (%)
1.	Performs hand hygiene	0	0	21	100
2.	Don gloves	21	100	0	0
3.	Clean the port of the tube with disinfectant	0	0	21	100
4.	Aspirate the urine from the port with sterile syringe	0	0	21	100
5.	Open the sterile urine container and drop the urine in and recap	21	100	0	0
6.	Discard gloves and perform hand hygiene	21	100	0	0

Table 4. Frequency and percenatge description of infection control practices during urinary catheter removal N=12

Sl.	Practices	Yes	No	No	
		Frequency(f)	**Percentage (%)**	**Frequency (f)**	**Percentage (%)**
1.	Perform hand hygiene	0	0	12	100
2.	Don clean gloves	12	100	0	0
3.	Aspirate the water to deflate the balloon	12	100	0	0
4.	Slowly pull the tube out	12	100	0	0
5.	Routine care of perineal area	1	8.3	11	91.7
6.	Discard gloves and perform hand hygiene	12	100	0	0

Table 5. Description of infection control practices during urinary catheter maintenance N=170

Sl.	Practices	Yes	No	No	
		Frequency(f)	**Percentage (%)**	**Frequency (f)**	**Percentage (%)**
1.	**Perform hand hygiene**	**50**	**29.41**	**120**	**70.59**
2.	Wear clean gloves	170	100	0	0
3.	Cleans the perineal area with soap and water	20	11.76	150	88.24
4.	Performs hand hygiene after procedure	152	89.41	18	10.59
5.	Catheter secured appropriately	161	94.70	9	5.3
6.	Maintain closed drainage system	161	94.70	9	5.3

Ethical Clearance: Ethical clearance was sought from institutional ethical committee (IEC No.748/2016), permission from Medical superintendent was sort and registered in CTRI. Informed consent from the participants was obtained after explaining the purpose of the study and assuring confidentiality of information.

Source of Funding: Self

Conflict of Interest: Nil

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TB Iris: A Clinical Outcome among HIV Patients Receiving Antiretroviral Therapy in a Tuberculosis Prevelant Area

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ABSTRACT

Introduction: IRIS remains as a major obstacle in effective administration of antiretroviral therapy. This study primarily focuses on evaluating the frequency of occurrence of TB-IRIS among HIV patients on antiretroviral therapy. Secondly, it focuses on establishing risk factors or predictors in patients developing TB-IRIS and finally this study aims to determine the various clinical outcomes and effect of IRIS development on survival rates among these patient.

Materials & Method: This study is retrospective hospital based executed in the ART centre in Mangalore, Karnataka. Diagnosis of TB-IRIS was made as per INSHI consensus case definition provided for resource-limited settings. The Data from January 2008 till September 2012 was evaluated via semi-structured questionnaire. Inclusion Criteria Patients eligible to receive ART and were above the age of 18. Those patients who were non-compliant with treatment or HIV patients no ton ART were excluded from our sample population

Results: A total of 125 patients were included in this study. 37(29.6%) had diagnosed TB before starting the treatment. 6(16.2%) out of the 37 HIV with combined TB patients progressed to paradoxical TB-IRIS when ART drugs were initiated. 88(70.4%) patients did not have active TB when ART was started, among whom 6 patients developed "unmasking" TB-IRIS. 8 (66.7%) out of the 12 patients developed IRIS in a period of three months of initiation of ART rest 4 (33.3%) patients developed after the three month period. 10 (83.33%)out of the 12 patients were male. 5 out of the 6 patients with paradoxical TB-IRIS had extra-pulmonary TB at the time of ART initiation.

Conclusion: Consensus case definition for the resource limited setting is an effective tool in the diagnosis of TB-IRIS. TB-IRIS can be treated conservatively and although not fatal early diagnosis and management can prevent a complicated course of disease.

Keywords: *tuberculosis, immune reconstitution inflammatory syndrome, HIV/AIDS, antiretroviral treatment, Co-Infection.*

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INTRODUCTION

HIV/TB coinfection has extensively contributed to the global health burden and this converging dual epidemic has relentlessly remained a major public health challenge. Co- treatment of HIV/TB poses many challenges ranging from programmatic challenges and high pill burden to drug interactions and immune

reconstitution inflammatory syndrome(IRIS). Of these issues IRIS remains as a major obstacle in effective administration of antiretroviral therapy.[1], [2] Current theories concerning the pathogenesis of the syndrome involve a combination of underlying antigenic burden, the degree of immune restoration following antiretroviral therapy, and host genetic susceptibility.[3] It's a disorder commonly observed in severely immune-compromised patients who are initiated on antiretroviral therapy where the recovering immune system responds to a previously acquired opportunistic infection with an overwhelming inflammatory response that making the symptoms of the infection worse. HIV/TB co-infection is a leading cause of IRIS.[4] It has been demonstrated that patients with subclinical disease started on antiretroviral therapy may rapidly progress to symptomatic TB disease during the first three months of initiation of therapy as a result of immune reconstitution.

Two subsets of TB-IRIS have been described according to AIDS clinical trial group (ACTG) [5] [1] "paradoxical" TB- IRIS: paradoxical worsening of clinical symptoms occurs after the start of ART in patients receiving anti-tubercular therapy [2] "unmasking" TB-IRIS: a new presentation of tuberculosis that is "unmasked" in the weeks following initiation of ART with an exaggerated inflammatory response. The consensus case-definition proposed by international network for the study of HIV-associated IRIS (INSHI) [6] and meinjtes et al is a useful tool in resource-limited settings for the diagnosis of TB- associated IRIS, as was demonstrated in studies done in India by Sharma SK et al and Kumaraswamy et al. [7], [8], [9]) TB-associated IRIS in co-infected patients is most often self-limiting and may not be associated with significant long term effects but may complicate the management of both conditions and the assessment of clinical deterioration. [10]

This study primarily focuses on evaluating the frequency of occurrence of TB-IRIS, both unmasking and paradoxical TB-IRIS among HIV patients on antiretroviral therapy. Secondly, it focuses on establishing risk factors or predictors in patients developing TB-IRIS which can serve as screening tools to help foresee and manage this condition in the future and finally this study aims to determine the various clinical outcomes and effect of IRIS development on survival rates among these patient.

MATERIALS AND METHOD

This study is retrospective hospital based executed in the ART centre located in tertiary care hospital in Mangalore, Karnataka. Records of 125 HIV patients newly initiated on ART from January 2008 to September 2012 were evaluated using a semi-structured questionnaire. The study population included those who were eligible to receive ART and above the age of 18. Those patients who were non-compliant with treatment or HIV patients no ton ART were excluded from our sample population. Case of "paradoxical" and "unmasking" TB-IRIS was determined as per INSHI (International network for study of HIV associated IRIS) consensus case definition provided for diagnosis of TB-IRIS in resource- limited settings. Baseline parameters and demographic details were collected before starting the treatment with Anti Tubercular Therapy and further on that data was compared with patients progressing to TB-IRIS (cases) with those not progressing TB-IRIS (control group). Clinical outcomes and survival rates of patients developing TB-IRIS were noted. Data was analysed using SPSS version 11.5. The qualitative data was analysed using chi-square test and continuous data using Student t Test, P value less than 0.05 was considered statistically significant.

Case definitions:

Criteria drafted by International Network for Study of HIV-associated IRIS (INSHI) [6] was taken into consideration for cases who show signs and/or symptoms of paradoxical TB-IRIS.

RESULTS AND DISCUSSION

125 HIV patients newly initiated on ART were included in the study.

Characteristics	Frequency	Percentage
Age group(years)		
<30	13	10.4
30-40	55	44
41-50	43	34.4
>50	14	11.2
Gender		
Male	81	64.8
Female	44	35.2

Interval between Diagnosis and ART initiation		
<1 year	55	44
1-5 years	49	39.2
>5 years	21	16.8
Active TB at initiation of ART		
Extra-pulmonary TB	34	27.2
Pulmonary TB	3	2.4

Table 1 shows the baseline characteristics of study sample. The mean age was 40.05 years, ranging from 18 to 73 years. 81(64.8%) were male and 44(35.2%) were female. Mean interval between diagnosis of HIV and ART initiation was 2.88 years (sd 3.59). 39(31.2%) had active TB at the time of treatment. 34(27.2%) patients had extra-pulmonary TB and 5(4%) had pulmonary TB.

Prevalence of IRIS

A total of 12(9.6%) patients developed IRIS. At the time of initiation of ART 37(29.6%) had active TB, among whom 6 (16.2%) patients developed paradoxical TB-IRIS. 6 of 88 (6.81%) patients who did not have active TB at ART initiation developed "unmasking" TB-IRIS .8 (66.7%) out of 12 patients developed IRIS within 3 months of initiation of ART .4 (33.3%) patients developed IRIS between 3months to 2 years following ART initiation. The median duration for development of IRIS was 2 months.

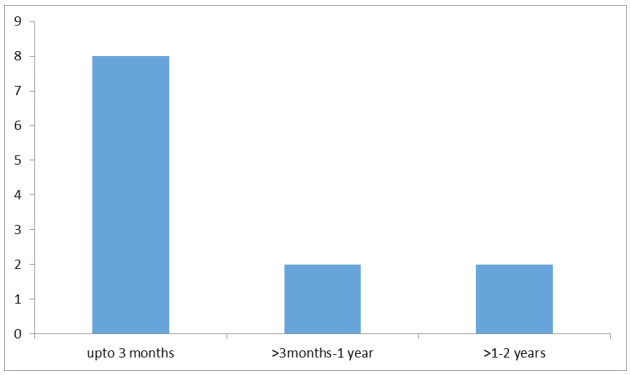

Figure 1 shows that among 37 patients with active TB at the time of ART initiation 6(16.2%) developed paradoxical TB-IRIS and among the 88 patients who did not have TB at ART initiation 6(6.81%) developed unmasking TB-IRIS. This also shows that frequency of occurrence of paradoxical IRIS is more than unmasking IRIS.

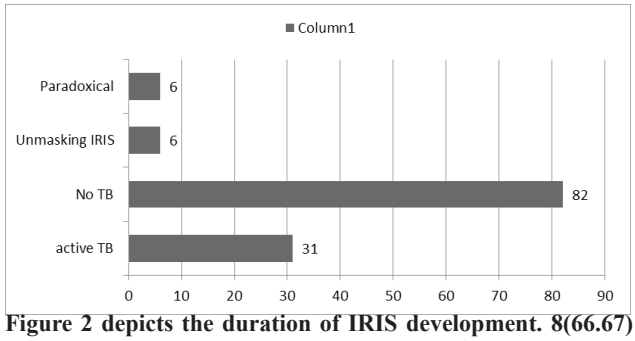

Figure 2 depicts the duration of IRIS development. 8(66.67) patients developed IRIS within 3months of ART initiation. 2(16.67%) patients developed IRIS between 3 months to 1 year. and 2(16.67%) patients developed IRIS within 1-2 years.

Sub-group Analysis:

A total of 12(9.6%) patients developed IRIS. At the time of initiation of ART 37(29.6%) had active TB, among whom 6 (16.2%) patients developed paradoxical TB-IRIS. While evaluating for Paradoxical TB-IRIS we found that all 6 patients were male. 5 out of the 6 patients had extra-pulmonary TB at ART initiation. All 6 patients developed paradoxical TB-IRIS within 3 months of initiation of ART (range: 8-90 days, mean: 46 days). Majority of the patients developing paradoxical TB-IRIS had extra-pulmonary TB, elevated ESR at the time of initiation of ART and short interval between ATT and ART initiation. 5 out of 6 patients recovered and one died within a week after admission due to Type I RF.

At ART initiation 88(70.4%) out of the 125 patients did not have active TB. 6(6.8%) out of the 88 patients developed unmasking TB-IRIS. 4 out of the 6 patients were male and 2 patients were female. All the patients developing unmasking TB-IRIS were given CAT I ATT treatment, 5 out of 6 patients recovered and one of them didn't recover and had features suggestive of disseminated TB

DISCUSSION

A total of 125 patients newly initiated on ART were included in this retrospective study. 37(29.6%) had diagnosed TB before starting the treatment. 6(16.2%) out of the 37 HIV with combined TB patients progressed to paradoxical TB-IRIS when ART drugs were initiated. The incidence of paradoxical TB-IRIS we found somewhat near to the results which were obtained by a meta-analysis done by Müller M et al. that took into consideration various IRIS studies till 2009 (with 95% CI 9.7- 24.5) [11]. A study conducted by Kumaraswamy et al [12] in south India reported a TB-IRIS incidence of around 8%. However studies conducted in high

income countries have reported a greater incidence of IRIS ranging from 11-43%([13-16]. The discrepancy in the incidence of IRIS between developed nations and developing nations can be attributed to various factors like lack of universal standardization of case definitions for TB-IRIS, or difference in protocols for initiation of ART.

When evaluating for predictors of paradoxical TB-IRIS we found that all 6 patients were male (Fischer exact: 0.12, Mid P value: 0.057). 5 out of the 6 patients had extra-pulmonary TB at ART initiation which was however not clinically significant on uni-variate analysis possibly due to our small sample size. All 6 patients developed paradoxical TB-IRIS within 3 months of initiation of ART (range: 8-90 days, mean: 46 days). Majority of the patients developing paradoxical TB-IRIS had extra-pulmonary TB, elevated ESR at the time of initiation of ART and short interval between ATT and ART initiation. However, we could not achieve the clear-cut conclusion of risk of TB-IRIS possibly because of small sample size.

At ART initiation 88(70.4%) out of the 125 patients did not have active TB. 6(6.8%) out of the 88 patients developed unmasking TB-IRIS. 4 out of the 6 patients were male and 2 patients were female. 2 out of the 6 patients developed umasking TB IRIS within 3 months and 4 patients developed symptoms between 3 months to 2 years. Patients developing unmasking TB IRIS had an average ESR of 91 (p= 0.24) as to those did not progress to develop TB, for whom the average ESR was 67. Although not statistically significant in our study we believe that this warrants further evaluation with a larger sample population. No other relevant predictors yielded significant results.

Clinical presentation of TB-IRIS can significantly vary from patient to patient, but literature from Kumaraswamy et al and Lawn et al [12), (17] reported cervical lymphadenitis as a frequent manifestation. In our study however majority of the patients with paradoxical TB-IRIS developed constitutional symptoms such as fever, weight loss. 4 out of the 6 patients presented with newly developed pleural effusion or some form of serositis which was confirmed by radio-imaging. On the other hand, we found a wide spectrum of presentation in patients with unmasking TB IRIS including TB lymphadenitis, TB spine, TB oesophagus, abdominal TB and disseminated TB. This shows that TB-IRIS has a vast spectrum of clinical manifestations.

Most patients developing IRIS were treated conservatively with anti-pyretic, steroids, or were symptomatically managed with no specific changes being made to their ATT or ART regimen. All our IRIS patients were managed on an inpatient basis with the average duration of hospitalization being 7-10 days. 10 out of the 12 patients recovered and 2 patients died during the course of hospitalization due to complications of retroviral disease other than TB-IRIS. Therefore we can conclude that although TB-IRIS may not be fatal, it complicates the course of disease and quality of life of the patient. Early diagnosis of TB-IRIS is possible using the consensus case definition despite the lack of access to investigations such as viral RNA load. We were unable to establish predictors for TB IRIS due to certain drawbacks, such as the lack of documentation of certain parameters like viral load and CD4 counts at regular intervals, as our study was retrospective.

CONCLUSIONS

Consensus case definition for the resource limited setting is an effective tool in the diagnosis of TB-IRIS. TB-IRIS can be treated conservatively and although not fatal early diagnosis and management can prevent a complicated course of disease.

Conflict of Interest – None

Source of Funding- Self Funded

Ethical Clearance - Ethical approval was obtained from the ethics committee of Institution Kasturba Medical College, Manipal Academy of Higher Education, located in Mangalore.

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The Use of Education Booklet for Anemia Prevention on Teenage Girls

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ABSTRACT

Background: The prevalence of anemia increased recently, in Central Kalimantan Province, Indonesia. This study aims to determine differences in knowledge, attitudes, and practices in peer education by using booklets and Modules on anemia in a teenage girl.

Method: The research method used is non-equivalent pretest-posttest with the control group. The study population was all high school girls or equivalent in Palangka Raya City in 2016 which totaled 4348 people. The sample in this study were girls of junior high schools in the City of Palangka Raya totaling 60 people. The treatment group were teenage girls in high school who were given intervention while the control group was teenage girls in high school who were not given intervention. Comparison of knowledge, attitudes, and behavior before and after education is made using the Wilcoxon test, while to compare knowledge, attitudes, and behavior between leaflets and booklets, the Mann-Whitney test was used.

Results: Wilcoxon test results showed that the increase in knowledge scores with a p-value of 0.211 (p> 0.05), an increase in attitude scores with a p-value of 0.022 (p> 0.05), an increase in behavioral scores with a p-value of 0.022 (p> 0.05). The results of the comparison test of the effectiveness of the use of leaflet and booklet media with the Mann-Whitney test for p-value knowledge is 0.669 (p> 0.05), the attitude of p-value is 0.623 (p> 0.05), and behavior p-value is 0.935 (p> 0.05). It

Conclusion: There was a significant increase in knowledge, attitudes, and behavior after the use of booklet media and modules on prevention of anemia in peer education in teenagers girls the use of media leaflets and booklets had the same effectiveness in increasing the knowledge, attitudes, and behavior of teenage girls about anemia prevention.

Keywords: *Booklet, Peer Education, Behavior, Anemia Prevention, Young Women*

INTRODUCTION

Anemia is the most common medical problem worldwide, as well as being a significant health problem for the community, especially in developing countries [(1)]. Anemia can occur in any age group including a teenager. Anemia in a teenager is a severe public health problem because it can slow psychomotor and cognitive development [(2)]. According to WHO, the teenager (10 to 19 years) is a period of susceptibility to anemia due to rapid growth and changes in behavior, diet and lifestyle habits. Young women have a ten times greater risk of anemia than young men. This is because girls experience menstruation every month and are in their infancy, so they need more iron intake. Besides, an imbalance in nutrient intake is also a cause of anemia in a teenager. Young women are usually very concerned about body shape, making so many limits on food consumption and various restrictions on food [(3)]. Therefore, the target of nutritional anemia prevention programs has been developed to reach girls in junior high school, and women outside of school as a strategic effort to break

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the cycle of nutrition problems. Even so, the prevalence of anemia among young women is still classified as high. The results showed that the incidence of nutritional anemia in teenage girls in Jakarta regions was 44.6% [10].

Though various efforts have been made by the government to overcome the problem of anemia in teenagers today, such as giving blood tablets, but other initiatives should be considered for example by involving the participation of peers in the youth group to prevent anemia in a teenager. The youth care health care program has not been maximized because not all schools have implemented this program, so other efforts are needed to be considered by optimizing the role of the teenagers themselves in this case, namely peers to prevent anemia [11].

Previous studies have suggested that peer group education affects the knowledge, attitudes, and skills of women of childbearing age in preventing anemia. [4] This is also supported by research which states that peer group support can increase knowledge, attitudes, and actions of pregnant women in preventing anemia. Peer group support helps pregnant women to get a lot of information from other members and also helps them to find a way out of their problems about preventing anemia [5].

METHOD

This research is an analytic study with a quasi-experimental design with pretest-posttest with control group design with the intervention of using booklets and modules on peer education about preventing anemia in young women. The population of the study was female teenagers of high school students in the City of Palangkaraya and the sample was 60 young women. The sampling method in this study is to use probability sampling with the simple random sampling technique.

RESULTS

The table below shows the characteristics of respondents in the control and intervention groups at the time of pretest and posttest. The intervention group showed 53% high knowledge and 50% control group. Details of respondent's reaction can be seen in Table 1 below. According to WHO, prevention of anemia requires an approach that has the potential to overcome all factors. Interventions to prevent iron deficiency include steps to increase iron intake through a food-based approach, diversification, namely diet and iron-fortified foods; iron supplementation; improvement of health services and sanitation [12]. One form of prevention of anemia in teenagers is education through booklets with the help of peers

Table 1. Characteristics of Respondents in the Control and Intervention Groups

Variable	Intervention Group				Control Group			
	Pre-Test		Post Test		Pre Test		Post Test	
	n	%	n	%	n	%	n	%
Knowledge Low High	16 14	53.3 46.7	14 16	46.7 53.3	15 15	50 50	13 17	43 57
Attitude Does not support Support	11 19	36.7 63.3	7 23	23.3 76.7	15 15	50 50	15 15	50 50
Behavior Negative Positive	16 14	63.3 36.7	14 16	36.3 63.6	15 15	50 50	14 16	36.3 63.6

Table 2. Comparative Testing of Knowledge, Attitude, and Prevention Behavior Anemia

Variable	Booklet Group			Module Group		
	Mean ± SD		p-value	Mean ± SD		p-value
	Pre-test	Post-test		Pre-test	Post-test	
Knowledge	10.43± 1.79	12.47± 0.94	0.000	10.57± 1.36	11.63± 1.47	0.001
Attitude	38.87± 6.99	44.97± 5.15	0.000	42.47± 2.54	45.13± 1.63	0.000
Behavior	49.13 ±4.87	56.67 ±3.30	0.010	51.30±3.95	55.13± 4.22	0.000

Based on Table 1 and 2 it can be analyzed the comparison of knowledge between before and after peer education using booklet media. The average knowledge score before being given training was 10.43 ± 1.79 and the average knowledge score after being given instruction utilizing the booklet media was 12.47 ± 0.94. The descriptive test indicated an increase in knowledge scores. Using the Wilcoxon test, a p-value of 0.000 was obtained ($p < 0.05$). From this test, it was shown that the increase in the knowledge score was statistically significant and higher than the module group.

The comparison of the effectiveness of using media modules and booklets in improving knowledge, attitude, and prevention behavior of anemia in young women is shown in Table 3.

Table 3. Comparison of the Effectiveness of Using Media Modules and Booklets

Variable	Mean ± SD		p-value
	Booklet	Module	
Knowledge	12.47 ± 0.94	11.63 ± 1.47	0.022
Attitude	44.97 ± 5.15	45.13 ± 1.63	0.002
Behavior	56.67 ± 5.30	55.13 ± 4.22	0.049

DISCUSSIONS

Peer association can influence premarital sexual behavior. The influence can be positive and negative [13]. The results showed more than half (54.3%) of the role of peers active in providing information about reproductive health. There is a relationship between positive peer roles and premarital sexual behavior, where respondents with passive peers have 2.6 times the chance of premarital sexual behavior compared to respondents with active peers. Peer roles in sexual behavior are not influenced by confounding variables (knowledge, attitudes, parental roles, and mass media exposure) [9].

The knowledge value of teenagers who use the Module media is 11.63 ± 1.47, and the average knowledge score of young women who use booklet media is 12.47 ± 0.94. By using the Mann-Whitney test, the p-value was obtained at 0.022 ($p < 0.05$). From this test it is shown that knowledge scores differ statistically significant, it can be concluded that the use of booklet media has higher effectiveness than media Modules in increasing the knowledge of young women about preventing anemia. The results of previous studies showed that there were significant differences between the use of Module media and booklets in the prevention of teenagers anemia education with a value of $p < 0.05$, this proved that the booklet media was more effective to use. But one interesting thing is, education through peers about the prevention of teenagers anemia has a significant meaning in changing the knowledge, attitudes, and behavior of teenagers [6]. This study was also supported by significant differences between expertise before and

after peer group education interventions. Substantially the difference is very significant to the behavior changes in preventing iron nutritional anemia in teenagers. If someone already knows health, it will facilitate the formation of health behaviors [7].

The value of the attitude of teenagers, who use the module media is 45.13 ± 1.63, and the average attitude score of young women who use booklet media is 44.97 ± 5.15. By using the Mann-Whitney test, the p-value was obtained at 0.002 ($p < 0.05$). From this test, it is shown that attitude scores differ statistically significant, or in other words, the use of booklet media has higher effectiveness than media modules in improving the attitudes of young women about preventing anemia. Using the Wilcoxon test, a p-value of 0.000 was obtained ($p < 0.05$). In connection with this study, peer education about anemia prevention is expected to help young women determine their attitudes towards preventing anemia, because in peer groups develop mutual respect and support each other and be responsible for things that have been agreed upon together. Research shows that peer groups influence students both in attitude formation and can lead to motivation and learning activities. The better the peer group relationship, the higher the student's motivation is. Conversely, if the relationship between peer groups is not good, learning motivation will be lower [8].

The value of the teenager's behavior, which uses the module media is 55.13 ± 4.22, and the average behavior score of young women who use booklet media is 56.67 ± 5.30. By using the Mann-Whitney test, the p-value obtained was 0.049 ($p < 0.05$). From this test, it is shown that the behavioral scores differ statistically significant. In this study, there was a difference in behavior between before and after peer education using booklet media. An increase in scores indicates this. By using the Wilcoxon test, a p-value was obtained at 0.010 ($p < 0.05$). Based on behavioral science, those behavioral changes occur gradually, there is a change in knowledge, then changes in attitude and after being internalized, there is a change in perspective [7].

Previous research shows that in teenagers, the closeness of the relationship between teenagers and peers increases dramatically, and at the same time the proximity of the relationship between teenagers and parents decreases significantly. In teenagers communication and trust in parents diminish and turn to peers to meet the need for attachment. Noting the importance of the role of peers, the development of a positive peer environment is an effective way that can be taken to support the development of teenagers. A positive peer culture provides opportunities for teenagers to test the effectiveness of communication, behavior, perceptions, and values they have [13].

CONCLUSION

There is a significant difference in knowledge before and after the use of media booklets and modules on anemia in peer education in young women. The method of booklet media is more effective in increasing attitude changes compared to the module in peer education. Booklet media means can significantly change the behavior of prevention of female teenager compared to the module on anemia in peer education in teenager girls.

Ethical Clearance: The Ministry of Health Polytechnic approved this research in Central Kalimantan, Indonesia. We also wish to thank all the participants who contributed to this study.

Conflict of Interest: Nil.

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A Preliminary Host Toxicity Study of *Pterocarpus Marsupium* on Lymphocytes Isolated from Cord Blood

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ABSTRACT

Aim and objectives: *In vitro* study of the toxic activity of aqueous extract of heart wood of *Pterocarpus marsupium* on lymphocytes of human cord blood. *Pterocarpus marsupium* is a traditional drug used as an anti-diabetic agent for ages in India. Many research works have proved its efficacy as antidiabetic medication, but there is hardly any report regarding its toxicity on from the available literature. This study was undertaken to conduct its toxicity study.

Material and Method: Lymphocytes from human cord blood were cultured in Dulbecco's modified eagle's medium.The toxicity of the aqueous extract of heart wood *Pterocarpus marsupium* was assessed by Acridine orange/Ethidium Bromide(AO/EB) Staining method as well as by 3-[4,5- dimethylthiazol-2-yl]2,5-diphenyl tetrazolium bromide(MTT) assay. The results were analyzed statistically.

Results: *Pterocarpusmarsupium* extracts showed that extract amounts up to 50 mg/ml are found safe based on the absence of abnormal blood cell counts and blood chemistry values and the absence of extract-related adverse events

Keyword: *Heart wood of Pterocarpus marsupium, lymphocyte, toxicity, cord blood.*

INTRODUCTION

In the present scenario the most prevalent disease affecting world-wide is diabetes mellitus. Many medications are being introduced to treat this disease. Along with modern medicines many medicines derived from natural herbs are also being tried for this purpose. One of such potent natural herb is *Pterocarpus marsupium*. This plant is commonly known as Indian Kino and also known as Vijayasar in Sanskrit, Bijsal, Bibla etc. It is a long deciduous tree which belongs to Leguminaceae family. It is mostly found in evergreen forest of central, western and southern parts of India. (manish et al 2009, Gariole et al.,2010)[1,2]. It is a medium to larged sized tree of height ranging from 15 to 20 mts. Leaves are compound and imaparipinate. Flowers are yellow in terminal panicles. Fruits are circular. (patil et al 2011)[3]

Its medicinal value is known since age long from period of charaka and sushruta. The beauty of this tree is its multidimensional activity. In ancient literature like charaka samhita, prameha chikitsa it is described as rasayana or immunomodulators. Many work shows its potency as hypoglycaemic drug and has capacity for beta cell regeneration.[4, 5] It also has its action on liver mostly Hepatoprotective activity.[6] Its antidiabetic activities are also due to its Anti-hyperinsulinaemic and anti-hypertriglyceridaemic activities[7]. It helps to reduce sugar level in the body as it is having Insulin like action[8-13], has Increased expression of glucose transporter[14] and has inhibition of digestive enzymes amylase and glucosidase[15]. It is also having the potency of decreasing the elevated TNF-α (kirana halagappa)[16]. Its antidiabetic effect also potentiates its anti cataract effect[17]. it is also used as astringent, antiinflamatory, antihemotic agent. This plant with so many efficacies is

a boon for mankind[18].

This drug with varied range of medicinal activities is mostly known for its antidiabetic effect used in diabetic patients for ages. Many toxicity studies has been carried out with animal models to see its toxic dosage[8,17, 18] .This study is done to see its toxic effect, which is done on human cells. In this study we evaluate the toxicity of aqueous extract of *Pterocarpus marsupium* with human chord blood lymphocytes.

MATERIAL AND METHOD

The heartwood of *pterocarpus marsupium* was collected from local market. It was dried properly in shade at room temperature [19]. Then the woods were cut into small pieces and grinded in electric grinder. The powder obtained was soaked in equal amount of water for 24 hrs. The macerated pulp was filtered through coarse sieve [19,17] .The filterate was dried in water bath at temperature ranging from 40˚c to 60˚c. A sticky consistency of filterate was obtained.This filterate was completely lyophilized by continuous freeze drying operation to obtain a dry powder [20].

Isolation of Lymphocytes

Umbilical cord blood (UCB) was collected in a sterile 50 mL falcon tube (Tarsons, Kolkata, India) containing 500 µL of 1000 IU heparin (HiMedia). The UCB that was collected immediately after the delivery of an infant, and the blood sample (50 mL) was stored at 4^0C until use. Lymphocytes were isolated immediately or within 24 hours after the collection. For the isolation of lymphocytes, the collected UCB sample was diluted with an equal volume of phosphate-buffered saline (PBS) solution. The mixture was carefully loaded for overlayering into a centrifuge tube with lymphocyte separating medium (LSM; HiMedia), which was one-third the total volume of the mixture. The total mixture was then centrifuged at 1800g for 25 minutes at room temperature. The buffy coat with mononuclear cells was carefully removed from the tube with layers. The layers (heavy to light) obtained are red blood cell, LSM, buffy coat, and plasma. The cells of the buffy coat layer, after dilution with another aliquot of PBS at the 1:1 ratio, were recentrifuged at 2000g for 5 minutes. The lymphocytes pellets were used for culturing, and the cell counts were measured using a hemocytometer.

Growth of lymphocytes and assessment of toxicity by staining method

The UCB-derived lymphocytes were diluted to the density of 1 X 10^6 cells/mL with a required volume of Dulbecco's modified Eagle's medium with low glucose (HiMedia), and were loaded into a six-well culture plate (Tarsons), which contained 15% fetal bovine serum (Sigma, Taufkirchen, Germany), 1% penicillinestreptomycin, and 1% sodium pyruvate, along with different concentrations of aqueous extract of heartwood of *Pterocarpus marsupium* (50, 25, 12.5, 6.25, and 3.125 mg/mL) with 10% DMSO solution for the growth of UCB-derived lymphocytes. The stock solution of the *P. marsupium* extract was prepared by dissolving 50 mg of extract of the plant in a 1 mL aliquot of 10% DMSO solution, and the stock solution was stored at 4 ^{0}C for further use; the total volume of 2 mL was maintained for each well of the culture plate with extract. The cells were incubated with different concentrations of the extract (50, 25, 12.5, 6.25, 3.125, and 0 mg/mL) at 37^0C under 5% atmospheric CO_2 concentration for 24 hours. Their viability was investigated using the acridine orange/ethidium bromide (AO/EB) staining under a fluorescent microscope (Magnus, Noida, New Delhi, India). The AO/EB solution was prepared in PBS at the concentration of 100 mg/mL. Green color indicated live cells, whereas cells with orange and red color were apoptotic and necrotic cells, respectively. Toxicity values were obtained with concentrations of 50, 25, 12.5, 6.25, 3.125, and 0 mg/mL aqueous heart wood extract, after 24 hours of incubation. Percentages of lethality values of the third repeated experiment were converted to probit values (Finney's method), which were plotted against the corresponding $\log_{10}$ values of aqueous leaf extract[21]. The probit values of the observed lethality percentages are from statistical tables of probit transformations[22].

RESULTS

Treatment of lymphocytes with different concentrations of methanolic leaf extract of plant *pterocarpus marsupium* for 24 hours resulted in a limited decreasing pattern of living cell counts. The number of dead cells increased a little upon increasing the leaf extract level from 3.125 to 50 mg/mL. Probit values presented in Table 1 were used in the ordinate and log10 values of plant extract concentrations in the abscissa for the construction of the plot (Fig. 1), from which it was ascertained that for values of lethal

concentration 25 (LC25), the corresponding log10 concentration value was 1.77. Antilog values of the obtained log10 concentration value were 58.88 mg/mL, which is regarded as the LC25 value of the leaf extract against human lymphocytes.

Table 1: Probit transformation and computations of probit values of both observed and expected partial lethal ranges for the leaf extract a during toxicity studies with lymphocytes assessed by AO/EB staining.

Concentration	Log_{10} concentration	Percent lethality	Probit values
0		0	4.28
50	1.698	23.6	4.07
12.5	1.397	17.7	3.81
6.25	1.096	11.8	3.81
3.125	0.795	11.8	3.43

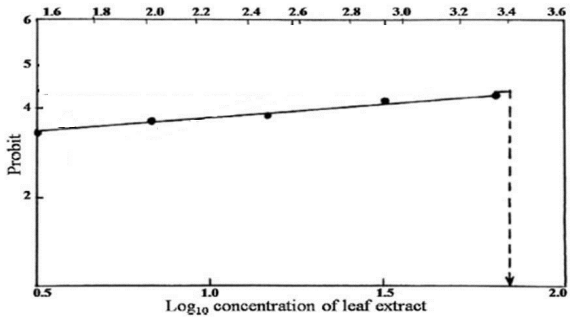

Fig 1: Probit analysis LC_{25} of the plant extract

DISCUSSION

Pterocarpus marsupium is a valuable drug for its multidimensional activity so its toxicity study becomes although more important. Toxicity study on animals can risk their lives. So study on human cord blood is a better choice as there is no life threats. This study shows The MIC value to be 200 mg/lt. So the drug is safe for human consumption. Acute toxicity study done on animal by oral administration of pterocarpus marsupium in various doses of 500, 1000, 2000, 4000and 8000 mg/kg indicated no mortality up to 7 days after treatment[23]. There was no toxic effect found in neurological system upto a dose of 3000mg/kg body weight of PMS when done on wistar albino rats[24]. No toxic effect was found up to 20 to 50 times of the effective dose of the aqueous extract of Pterocarpus marsupium[25].So this drug is totally safe as per the dose prescribed by ICMR project[26]

CONCLUSIONS

Since, the 25 mg/l or 25000 mg/ml as MIC was far more than the LC_{25} value of 134.896 mg/ml, it was inferred that there was no cytotoxicity due to 50 mg/ml of the extract on human lymphocytes. Thus the plant is totally non-toxic to man.

Ethical Clearance: This study is approve from our institutional ethics committee.

Source of Funding: Self

Conflict of Interest: Nil

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Comparative Study of Indian Hospital Planning Guidelines for Inpatient Wards

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ABSTRACT

Historically, inpatient accommodation has been the core component of the hospital and accounts for a significant proportion of space in a hospital.[1]

As the inpatient beds account for almost 70% to 80% of the revenue beds in a tertiary care private hospital, it is important to functionalize the size of rooms and focus on patient and family needs.

Space efficiency in a hospital is perhaps the most important element of any design. Coupled with adequacy, space efficiency can have a significant bearing on capital cost, operational cost as well as proper functioning of a hospital.

Government agencies involved in the granting of permission to build hospitals in India, be it planning agencies or accreditation agencies, are silent on the aspect of space planning, adequacy or efficiency.

Keywords*: Inpatient, Planning Guidelines, Design Parameters, Components*

INTRODUCTION

With increasing cost of real estate and non-availability of large spaces in cities, space utilization and efficiency can provide a solution in delivering effective and competitive healthcare. Space efficiency can help in increasing the quantum as well as scope of services of a healthcare provider.

Private healthcare in India constitutes almost 74% of the total healthcare expenditure and 40% of hospital beds in the country[2]. Absence of a comprehensive planning guideline has led to several Government organizations publishing their own guidelines while the Private sector depends on their internal systems. Several countries like USA, UK and Australia have published comprehensive guidelines on Hospital Planning.

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AIM

Comparative study of the Indian Planning Guidelines – Indian Public Health Standards and Indian Standards

OBJECTIVE

1. To study the Indian Planning Guidelines published by Ministry of Health & Family Welfare, Government of India & Bureau of Indian Standards.
2. Identify the design parameters of Inpatient wards amongst all the studied guidelines
3. Identify the components of Inpatient wards amongst all the studied guidelines
4. Suggest recommendations to rationalize the design parameters and components of inpatient wards

LITERATURE REVIEW

Following is the extract of planning guidelines:

1. Indian Public Health Standards. Guidelines for Sub-district/Sub-divisional Hospitals (31 to 100 Bedded) Revised 2012.3

Categories of inpatient beds

General ward – Male & Female

Private wards: 10% of the total bed strength is recommended as private ward beds.

Wards for specialities

20% of the total beds should be earmarked for day care facilities

Size of ward

Nurse station should cater to around 40 – 45 beds

Circulation areas

Circulation areas in the hospital should not be more than 55% of the total floor area of the building

Components of wards

Nursing station

Duty doctor's room

Pantry

Isolation room

Treatment room

Nursing store

Wards & Toilets

2. Indian Public Health Standards for 101 – 200 bedded District Hospitals – January 2007.4

Categories of inpatient beds

General wards: male & female

Private wards: 10% of the total bed strength is recommended as private ward beds.

Wards for specialities

Size of ward

On an average, one nursing station per ward will be provided. However it should be ensured that nursing station caters to about 40 – 45 beds

Circulation areas

Circulation areas like corridors, toilets, lifts, ramps and other common spaces etc. in the hospital should not be more than 55% of the total floor area of the building

Components of wards

Nursing station

Duty doctor's room

Pantry

Isolation room

Treatment room

Nursing store

Toilets

3. Indian Public Health Standards (IPHS) Guidelines for District Hospitals (101 – 500 bedded) Revised 2012.5

Categories of beds

General IPD beds shall be categorized as following

- Male medical ward
- Male surgical ward
- Female medical ward
- Female surgical ward
- Maternity ward
- Paediatric ward
- Nursery
- Isolation ward

10% of the total bed strength is recommended as private ward beds.

20% of the beds may be earmarked for day care facilities

Size of ward

On an average, one nursing station per ward will be provided. However it should be ensured that nursing station caters to about 40 – 45 beds

Circulation areas

Corridors shall be at least 3 m wide

Area per bed

Floor space for hospital beds (General): 15 to 18 sqm per bed

Bed space : 7 sqm

Bed spacing / clearances

Minimum distance between two bed centres: 2.5 m

Clearance at foot end of bed : 1.2 m

Components of wards

Nurse station

Duty doctor's room

Pantry

Isolation room

Treatment room

Nursing store

Toilets

Dirty utility room

Janitor room

4. Indian Standard 10905 (Part 2) 1984 (Reaffirmed 2003). Recommendations for basic requirements of General Hospital Buildings. 6

Categories of inpatient beds

General Wards

Wards for specialities

Intensive care Unit

Two single bedded rooms per ward for isolation should be provided of an area of 14 sqm should be provided.

Size of ward

Normally a ward shall comprise of 25 – 36 beds

Layout of ward

Wards may be Nightingale or Rigs type

Area per bed

An area of 7 sqm per bed is recommended

Isolation room : 14 sqm + toilet

Single room : 14 sqm + 3.5 sqm toilet

Twin room : 21 sqm + 3.5 sqm toilet

Common toilets for two rooms: 5.25 sqm

Bed spacing / clearances

Minimum distance between two bed centres: 2.25 m

Clearance between bed and wall : 200 mm

Planning grid

A usable space planning module of 14 sqm based on basic space unit of 3.5 sqm has been stipulated in order to rationalize the requirements of various facilities of the hospital. The space planning module is derived by assuming planning grid of 1.6 m. Six such grid units that is 3.2 x 4.8 m will lead to a carpet area of about 14 sqm after deducting space taken by walls. Fractional variation in floor spaces in actual planning may be ignored

Components of wards

- Nurse station : 14 to 17.5 sqm
- Staff toilet : Included in above
- Duty doctor room with toilet : 17.5 sqm
- Clean utility room : No mention
- Treatment room : 10.5 to 17 sqm
- Laboratory : 7 sqm (common to two wards)
- Pantry : 10.5 sqm
- Ward Store : 10.5 to 17 sqm
- Trolley bay : 10.5 sqm
- Sluice room : 10.5 to 14 sqm
- Janitor closet : 3.5 sqm
- Day space : 14 sqm
- Patient relatives waiting with toilets : 14 to 17.5 sqm

5. Indian Standard 12433 (Part 1) 1988 (Reaffirmed 1998). Basic requirements for Hospital planning (Part 1 up to 30 bedded hospital)7

Categories of inpatient beds

One single bedded rooms per ward for isolation should be provided. An area of 14 sqm should be provided

Layout of ward

Wards may be Nightingale or Rigs type

Circulation areas

Circulation areas should not be less than 30% of the total building area

Area per bed

An area of 7 sqm per bed should be provided

Bed spacing / clearances

Minimum distance between two bed centres : 2.25 m

Clearance between bed and wall : 200 mm

Components of wards

- Nurse station
- Treatment room
- Ward pantry

- Ward store
- Sluice room
- Day space
- Sanitary facilities
- Clean utility
- Trolley bay
- Doctors rest room
- Nurses duty room

6. Indian Standard 12433 (Part 2) 2001 (Reaffirmed 2011). Basic requirements for Hospital planning (Part 2 up to 100 bedded hospital)8

Categories of inpatient beds

One single bedded rooms per ward for isolation should be provided. An area of 14 sqm should be provided

General wards

Private wards (optional)

Wards for specialities

Layout of ward

Wards may be Nightingale or Rigs type

Circulation areas

Conversion factor for circulation space is 40% over the carpet area. Circulation space includes corridors, stairs, fire escapes, walls, ramps lifts etc.

Circulation area should not be more than 40% of the total floor area

Area per bed

An area of 7 sqm per bed should be provided

Bed spacing / clearances

Minimum distance between two bed centres : 2.25 m

Clearance between bed and wall : 200 mm

Components

- Nurse station with clean utility
- Treatment room
- Ward pantry
- Ward store
- Sluice room
- Day space
- Patient conveniences

Single room toilet : 3.5 sqm

Twin room toilet : 3.5 sqm

Shared toilet : 5.25 sqm

7. Indian Standard 15902 - 2010. Guidelines for nursing homes.9

Categories of inpatient wards

General wards for male, female and paediatric patients

Private ward

Intensive care ward

Components

- Nurse station with CU & DU : 14 sqm
- Treatment room : 10.5 sqm
- Ward pantry : 7 sqm
- Ward store : 7 sqm
- Sluice room : 3.5 sqm
- Day space : 10.5 sqm
- Patient conveniences : No mention
- Isolation bed with attached toilet : 14 sqm
- General bed : 7 sqm
- Janitor closet : 3.5 sqm
- Single bed : 14 sqm
- Toilet for single ward : 5.25 sqm
- Twin bed : 21 sqm
- Toilet for twin bed : 5.25 sqm

METHODOLOGY

Seven Indian guidelines were taken up for the comparative study. The design parameters for inpatient wards mentioned in all the above planning guidelines were identified along with the commonalities amongst them

In the next step, components of the Inpatient ward listed in all the planning guidelines were listed and commonalities identified.

FINDINGS

List of design parameters of inpatient wards collated from all Planning Guides is listed below:

1. **Categories of inpatient beds**
2. **Size of ward**
3. **Layout of ward**

4. Circulation areas
5. Width of corridors
6. Area per bed
7. Spacing between beds
8. Clearance on head side
9. Clearance on foot end
10. Planning grid

List of components of inpatient ward collated form all Planning Guides is listed below:

1. Nurse station
2. Clean Utility
3. Trolley bay
4. Treatment room
5. Laboratory
6. Nursing store
7. Ward store
8. Pantry
9. Duty Doctor room
10. Nurse duty room
11. Staff toilets
12. Dirty Utility / Sluice
13. Janitor
14. Day space
15. Waiting with toilets

OBSERVATIONS

It has been observed that there is a wide variation in the design parameters and components of wards in the studied Indian Planning Guidelines. The commonalities are few.

List of various design parameters of the Inpatient ward as mentioned in the seven Indian Planning Guidelines are mentioned in Table 1.

Table 1: Design parameters of Inpatient wards

Sr	Parameter	IPHS 31-100[3]	IPHS 1010-200[4]	IPHS 101-500[5]	IS 10905 (2)[6]	IS 12433 (1)[7]	IS 12433 (2)[8]	IS 15902[9]
1	**Categories of IP beds**	Yes	Yes	Yes				
a	General ward – male	Yes	Yes	Yes	Yes	X	Yes	Yes
b	General ward - female	10% of beds	10% of beds	10% of beds	X	X	X	Yes
c	Private ward	X	X	X	Yes	X	Yes	Yes
d	Twin beds	Yes	Yes	Yes	Yes	X	X	X
e	Wards for specialities	20% of beds	X	20% of beds	Yes	X	Yes	Paediatrics
f	Beds for day care	X	X	Yes	X	X	X	X
g	Isolation ward				2 per ward	1 per ward	1 per ward	Yes
2	**Size of ward**	40 – 45 beds	40 – 45 beds	40 – 45 beds	25 -36 beds	X	X	X
3	**Layout of ward**	X	X	X	Nightingale or Rigs	Nightingale or Rigs	Nightingale or Rigs	X
4	**Circulation areas**	55% of total area	55% of total area	X	X	30% of total area	40% of total area	X
5	**Width of corridor**	X	X	3 m	X	X	X	X
6	**Areas for beds**							
a	Bed space	X	X	7 sqm	7 sqm	7 sqm	X	X
b	Floor space for beds	X	X	15 - 18 sqm	X	X	X	X
c	Single room	X	X	X	14 sqm	X	X	X
d	Twin room	X	X	X	21 sqm	X	X	X
e	Isolation room	X	X	X	14 sqm	X	14 sqm	X

Cont... **Table 1: Design parameters of Inpatient wards**

7	**Bed spacing / clearances**							
a	Between beds	X	X	2.5 m	2.25 m	2.25 m	2.25 m	X
b	Foot end	X	X	1.2 m	X	X	X	X
b	Head end	X	X	X	200 mm	200 mm	200 mm	X
8	**Planning grid**	X	X	X	Unit – 3.5 sqm	X	X	X

The commonalities of the design parameters are given in table 2

Table 2: Commonalities in Design Parameters

Sr	Parameter	Commonality
1	**Categories of IP beds**	
a	General ward – male	6 out of 7
b	General ward - female	6 out of 7
c	Private ward	6 out of 7
d	Twin beds	1 out of 7
e	Wards for specialities	5 out of 7
f	Beds for day care	2 out of 7
g	Isolation ward	4 out of 7
2	**Size of ward**	4 out of 7
3	**Layout of ward**	3 out of 7
4	**Circulation areas**	4 out of 7
5	**Width of corridor**	1 out of 7

Cont... **Table 2:**

Sr	Parameter	Commonality
6	**Areas for beds**	
a	Bed space	3 out of 7
b	Floor space for beds	1 out of 7
c	Single room	1 out of 7
d	Twin room	1 out of 7
e	Isolation room	2 out of 7
7	**Bed spacing / clearances**	
a	Between beds	4 out of 7
b	Foot end	1 out of 7
c	Head end	3 out of 7
8	**Planning grid**	1 out of 7

List of various components of an Inpatient ward as mentioned in the seven Indian Planning Guidelines are mentioned in Table 3

Table3: List of components of Inpatient wards

Sr	Component	IPHS 31-100[3]	IPHS 101-200[4]	IPHS 101-500[5]	IS 10905 (2)[6]	IS 12433 (1)[7]	IS 12433 (2)[8]	IS 15902[9]
1	Nurse station	√	√	√	√	√	√	√
2	Clean Utility	X	**X**	**X**	√	√	√	√
3	Trolley bay	**X**	**X**	**X**	√	√	**X**	**X**
4	Treatment room	√	√	√	√	√	√	√
5	Laboratory	**X**	**X**	**X**	√	**X**	**X**	**X**
6	Nursing store	√	√	√	X	X	**X**	**X**
7	Ward store	**X**	**X**	**X**	√	√	√	√
8	Pantry	√	√	√	√	√	√	√
9	Duty Doctor's room	√	√	√	√	√	**X**	**X**
10	Nurses duty room	**X**	**X**	**X**	**X**	√	**X**	**X**
11	Staff toilets	**X**	√	√	√	**X**	**X**	**X**
12	Dirty utility / sluice	**X**	**X**	√	√	√	√	√
13	Janitor	X	X	√	√	**X**	**X**	√
14	Day space	**X**	**X**	**X**	√	√	√	√
15	Waiting with toilets	X	X	X	√	X	X	X

The commonalities of components of an Inpatient ward are given in Table 4

Table 4: Commonalities in components of Inpatient wards

Sr	Parameter	Commonality
1	Nurse station	7 out of 7
2	Clean Utility	4 out of 7
3	Trolley bay	2 out of 7
4	Treatment room	7 out of 7
5	Laboratory	1 out of 7
6	Nursing store	3 out of 7
7	Ward store	4 out of 7
8	Pantry	7 out of 7
9	Duty Doctor's room	5 out of 7
10	Nurses duty room	1 out of 7
11	Staff toilets	3 out of 7
12	Dirty utility / sluice	5 out of 7
13	Janitor	3 out of 7
14	Day space	4 out of 7
15	Waiting with toilets	1 out of 7

It can be observed that out of 15 listed parameters only three elements i.e. Nurse Station, Treatment room & Pantry are common to all the planning guides.

RECOMMENDATIONS

In view of the variation and limited commonalities in the planning guidelines it is recommended that two sections be incorporated in all the planning guidelines as listed below:

Planning parameters:

- Size of inpatient ward i.e. number of beds in a ward
- Categories of inpatient beds
  - o General ward – Male & Female
  - o Single beds
  - o Isolation beds
  - o Twin sharing beds
- Area for beds
  - o General ward
  - o Single beds
  - o Isolation beds
  - o Twin sharing beds
- Space around beds
  - o Distance between beds
  - o Clearance from foot end
  - o Clearance from sides
- Width of Inpatient corridor

Components of a ward

- Nurse station
- Clean Utility
- Ward store / Store
- Treatment room
- Stretcher / trolley bay
- Pantry
- Duty Doctors room
- Nurse in charge room
- Waiting area with toilets
- Staff toilets
- Dirty Utility / Sluice
- Janitor room

CONCLUSION

An inpatient ward is perhaps the largest component of a Hospital where the patient spends a significant time of the stay in a hospital. As the inpatient beds account for almost 70% to 80% of the revenue beds in a tertiary care private hospital, it is important to functionalize the size of inpatient rooms and focus on patient and family needs.

Government agencies involved in the granting of permission to build hospitals in India, be it planning agencies or accreditation agencies, are silent on the aspect of space planning, adequacy or efficiency.

A comprehensive planning guideline is essential to bring about efficiency and completeness in the process.

There is no **Conflict of Interest.**

The study is **Not Funded** by any agency.

The article is an outcome of PhD Research Process

There were no interventions on human/ animals, hence no Ethical Committee clearance was required.

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Correlation of Hematological Profile with CD4 Counts in Human Immunodeficiency Virus-Positive Patients in a Rural Area of South India

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ABSTARCT

Aim: Hematological manifestations are routinely encountered in individuals infected with Human immunodeficiency virus (HIV). The Study is aimed at analysing the significance of haematological parameters in HIV-infected patients and to correlate with CD4+ counts.

Materials & Method: The study was carried out over a period of two years and a total of 120 HIV positive patients were included. Patients were categorized into two groups, Group A include patients receiving Highly Active Anti-Retroviral Therapy (HAART) (n=68) & Group B include patients who were not on HAART (n=52). Hematological parameters inclusive of haemoglobin (Hb), total leukocyte count (TLC), differential count (DC), platelet count & CD4 counts were recorded.

Results: Prevalence of anemia in our study was (67.5%). Morphologically normocytic normochromic (NCNC) anemia was the most common variant accounting for 50% in group A and 57.78% in group B. prevalence of leukopenia in our study population was 28.33% with a slightly higher prevalence in group B (42.31%) than group A (17.65%). Total number of patients with low CD4+ count was 46 (38.33%).

Conclusion: Anemia is the commonest hematological abnormality encountered throughout the stages of HIV infection. Prevalence of anemia is higher among patients who are not on HAART. Anemia and leukopenia can also serve as an excellent screening tool to assess the disease progression in HIV patients.

Keywords: *HIV, Anemia, Leukopenia, HAART.*

INTRODUCTION

Human immunodeficiency virus (HIV) is a great threat to the humankind across the globe. HIV infection causes intense immunodeficiency state. According to the World Health Organization (WHO) HIV has infected 33.2 million people worldwide and In India, approximately 6 million populations are infected by the virus while about 1.5 million suffer from full-blown acquired immunodeficiency syndrome (AIDS)[1,2].

The disease affects the immune system, making individuals susceptible to various infections and disorders, among that hematological disorder are very common in all stages of HIV infection. Variations in Red Blood cells (RBC's), White blood cells (WBC's) and platelets parameters may be the initial presentation with

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HIV infection. These abnormalities are the consequences of HIV associated opportunistic infections, neoplasms or therapy related[3,4,5].

Hematological assessment which forms the preliminary investigation helps the clinicians to a great extend for ensuring better management of HIV infected individuals for improving the quality of their life, hence it is mandatory to follow the haematological parameters of individuals infected with HIV.

The study is aimed at analysing the haematological parameters in correlation with CD4 counts in HIV-infected patients. The objectives were to assess the degree and morphological type of anemia, to evaluate the prevalence of leukopenia and thrombocytopenia in the HIV seropositive individuals and to correlate with the CD4+ counts.

MATERIALS & METHOD

The current study was a prospective and observational study conducted on 120 HIV-positive individuals who attended the tertiary care hospital in Chidambaram, Tamilnadu, India for performing haematological investigation during the period of May 2009 to April 2011. The study was accepted and approved by the institutional ethical committee.

Cases were subjected to inclusion and exclusion criteria. To improve the accuracy of study, HIV infected individuals between the ages of 15 to 60 years, who were willing to participate was included in the study group after obtaining the consent. Patients included in this study were grouped into two, Group A include patients receiving HAART (n=68) & Group B include patients who were not on HAART (n=52)

The inclusion criteria included HIV-positive patients, symptomatic as well as asymptomatic, diagnosed by enzyme-linked immunosorbent assay (ELISA) method according to the National AIDS Control Organization (NACO) guidelines. HIV cases who were not in the age range, any primary hematologic disorder (such as thalassemia, leukemia, etc.), chronic renal/liver disease, receiving cytotoxic/immune modulating chemotherapy, pregnant and lactating women, individuals who were not willing to enroll themselves in the study were excluded from the study.

Two ml of venous blood collected under standard procedure protocol from all 120 indivuduals after getting their consent in two ethylene diamine tetra acetic acid (EDTA) Vacutainers. One sample was analyzed using an automated hematology cell counter, the quality checks of the instrument were performed according to the manufacturer's instructions. The values of blood count Erythrocyte (RBC) count, Hemoglobin (Hb), Haematocrit, Mean corpuscular volume, Mean corpuscular Hemoglobin concentration, Red cell distribution width, total leukocyte count (TLC), differential count & platelet count were recorded. Another sample was processed in a flow cytometer for CD4 counts. The values were tabulated and compared to the standard values of grading of anemia according to WHO guidelines

Anemia was defined using WHO criteria WHO/NMH/NHD/MNM/11.1. The hemoglobin cut off used to define anemia in men aged 15years and above was 13 gm / dl and non-pregnant women aged 15 and above was 12 gm / dl. Anemia was further graded as mild (Hb 11.0 - 11.9 g/dl), moderate (Hb = 8.0 -10.9 g/dl) and severe (Hb<8.0 g/dl) based on hemoglobin values

Statistical analysis

The statistical analysis were conducted by using IBM Statistical Package for the Social Sciences (SPSS) Software version 21.Univariate analysis to find out frequency, mean and standard deviation (SD). Multivariate analysis was performed for sex, age, CD4+ counts with the occurrence of cytopenia. Significance of the statistical tests at P value less than 0.05 was based on 95% confidence interval.

RESULTS

Of the 120 patients, 64 (53.33%) were females and 56 (46.67%) were males. The female to male ratio is 1.16:1. Forty (26.67%) are below age 10, 98 (65.33%) are within the age group of 21-50 years. Mean age was 34.49 (SD 9.13). The clustering of age and the sex profile are shown in fig no.1.

Anemia

Among the total study population 81 patients (67.5%) had anemia. Mean Hb was found to be 10.84 g/dl. About 79.69% (n=51) of female patients and 53.57% (n=30) of male patients were found to be anemic. The prevalence of anemia was higher among group B (86.54%, n=45) than group A (52.94%, n=36).The difference in prevalence among two groups was statistically significant

(P=<0.005). Grading of anemia among two groups was shown in table no.1. Morphologically normocytic normochromic (NCNC) anemia was the frequent type accounting for 18 cases (50%) in group A and 26 cases (57.78%) in group B, Microcytic Hypochromic (MCHC) was noted in 16 cases (44.44%) of group A and 19 cases (42.22%) patients in group B, Dimorphic anemia was observed in two cases (5.56%) in Group A. Of the 81 anemic patients, anemia with leukopenia was seen in 23 and anemia with thrombocytopenia was observed in 6 cases

White blood cell profile

Overall prevalence of leukopenia (Total Leukocyte Count <4000/mL) in our study population was 28.33% (n=34) with a slightly higher prevalence in group B 42.31% (n=22) than group A 17.65% (n=12). Mean total leukocyte count was 5764/mL. Among the total leukopenic patients, absolute lymphopenia (<1000/mL) was noted in 18 cases (52.94%), absolute neutropenia (<1500/mL) was observed in six cases (17.65%) and both lymphopenia and neutropenia was noticed in 10 cases (29.41%). Leukopenia with thrombocytopenia was observed in 9 cases and pancytopenia was seen 7 cases.

CD4+ profile

Total number of patients with low CD4 count (<200 cells/µL) was 46 (38.33%). Mean CD4 count was 454.5/µL. The lowest count was 76/µL; highest was 1300/µL. Distribution of patients with low CD counts in two different groups (group A and group B) is shown in table no.2. Of the 46 patients with low CD4 count 35 cases had anemia, 18 cases had leukopenia and thrombocytopenia was seen in two cases. The percentage of patients having anemia and leukopenia with low CD4 counts in two different groups was shown in fig no.2.

Platelet profile

A total of 23 patients presented with thrombocytopenia (platelet count <1.5 $\times 10^5$/dl) with an overall prevalence rate of 19.17%. Mean platelet count was found to be 2.11 $\times 10^5$/dl. Twelve patients (17.65%) in group A and eleven patients (21.15%) in group B showed thrombocytopenia respectively.

Table 1: Grading of Anemia among two Groups

Category	Group A (n=36)	Group B (n=45)
Mild	20 (55.56%)	18 (40%)
Moderate	13 (36.11%)	22 (48.89%)
Severe	03 (8.33%)	05 (11.11%)

Table 2: Distribution of patients in group A and group B with low CD4 counts

Category	Group A (n=68)	Group B (n=52)
CD4<200	17 (25%)	29 (55.77%)
CD4>200	51 (75%)	23 (44.23%)
	68 (100%)	52 (100%)

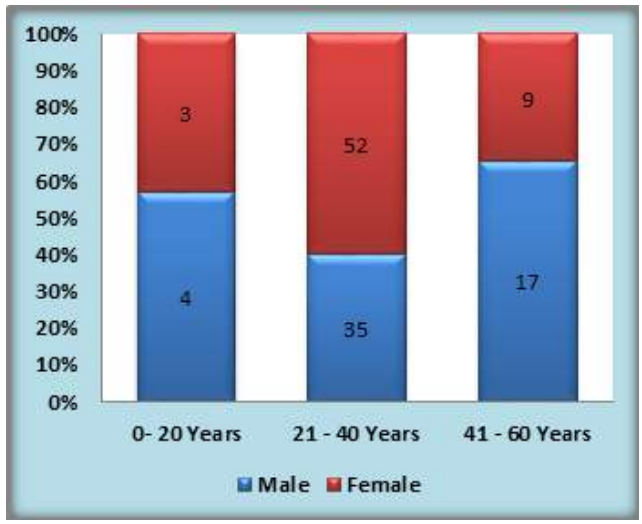

Fig 1: Age clustering and sex profile of HIV patients

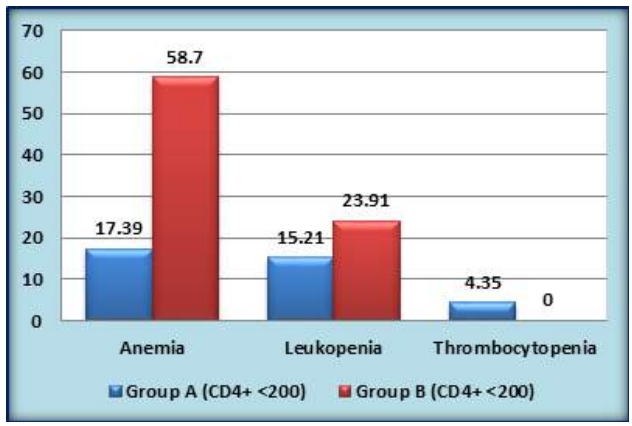

Fig 2: Percentage of patients with low CD4 counts in two different groups having anemia, leukopenia and thrombocytopenia

DISCUSSION

Anemia is the most common haematological manifestation encountered in the study. Incidence of anemia among group A might be attributed to the infections with HIV itself, co-existing iron deficiency, opportunistic infections, and suppression of bone marrow by anti-retroviral and other drugs used in the prophylaxis/treatment of opportunistic infections caused by HIV. Overall prevalence of anemia in our study was 67.5% which was marginally higher than other similar studies.

The current study confirmed that Group B patients had significantly outrageous prevalence rate of anemia when compared to the treatment Group A. Patwardhan et al revealed in their study that the patients who were not receiving HAART had higher prevalence of anemia, which is in accord with the current study[6]. The study also demonstrated that majority of the anemia patients in Group A (55.56%) had milder degree and its predominantly (48.89%) of moderate degree in Group B, these findings were contradictory with the study done by Thulasi, R Raman et al[7].

Our analysis confirmed that the normocytic normochromic anemia was the most common morphologic type succeeded by microcytic hypochromic anemia. The dominance of NCNC anemia (54.32%) is eminently significant ($p<0.005$). Dimorphic blood picture was observed in 2.47% (n=2) of anemic patients undergoing HAART, this might be due to therapy induced macrocytosis. These findings are in concordant with the other studies[8,9].

In the study about 28.33% of cases showed leukopenia with a considerably higher prevalence rate among Group B (42.31%), this is certainly at a higher fraction when compared to the other similar studies which reported leukopenia in the range of 10% -16 % [8,9,10]. The increased prevalence of leukopenia in the current study is not related to the clinical stage of the disease. About 60.7% of total leukopenic patients demonstrated anemia. This findings were in compliance with the studies done by Mathews SE et al[9] & Zon et al[11] who reported that an appreciable amount of hematologic abnormalities can coexists

All cases of pancytopenia showed low CD4+ counts and all patients with low CD4+ count showed leukopenia of which majority of the patient were lymphopenic which is in concurrent with the studied done by other authors. Considering the reality that the number of pancytopenia cases recorded in the study was only seven, an effective correlation cannot be determined. It may not be presumptuous to surmise that a low CD4+ count predisposes to pancytopenia thus alluding to pancytopenia being a harbinger of the low CD4+ count.

In the study it was observed that Group B had more number of patients with low CD4+ counts and mean CD4+ count was higher among Group A. In this multivariate analysis CD4+ counts were significantly correlated with anemia and leukopenia. Remarkable variation in the hematological parameters observed in patients with HAART, which might be because of the fact that HAART improves the CD4+ counts by lowering the CD4 destruction. It is certain that administration of HAART reduces the HIV load and might effect in diminishing the action of immune effectors, thereby ameliorating anemia and leukopenia. Anemia is the most frequent hematological manifestations encountered in patients with the reduced CD4+ count. This finding is in concurrence with other similar studies[12,13].

The study showed substantial consensus between lymphopenia and low CD4+ counts. Similar concurrence was also conceded by Amballi *et al*[14]. Overall prevalence of thrombocytopenia in our study was 19.17% (n = 23) the rate is higher compared to other similar studies[2,15].

LIMITATIONS

Few limitations required to be acknowledged concerning this study, this was a single hospital based study with limited sample size, so results cannot be generalised. Although routine hematologic investigations were taken into consideration, further specific investigations (viz iron studies, high-performance liquid chromatography, and Hb electrophoresis) should be carried out in such studies to rule out other causes of anemia.

CONCLUSION

Hematological irregularities are frequent phenomenon throughout the stages of HIV infection. Anemia & leukopenia serve as an excellent screening tool to assess the disease progression; these abnormalities also indicate patients' immune status and response to antiretroviral treatment.

Conflict of Interest: Nil

Funding: No

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Mammogram Analysis using Diffusion Wavelets

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ABSTRACT

An algorithm for classification of benign and malignant masses in digital mammograms is proposed in this paper. Feature vector is formulated based on the Diffusion Wavelets. Diffusion Wavelets are fast multi-scale framework for the analysis of functions on discrete (or discretize continuous) structures. Diffusion wavelets construct a compressed form of representation of the dyadic powers of a symmetric or non-symmetric square matrix by representing the associated matrices at each scale. Diffusion Wavelet coefficients are calculated for ROI's of preprocessed mammograms obtained from DDSM data base (Digital Database for Screening Mammography). Statistical parameters are calculated from Diffusion Wavelet Coefficients. The area under the curve A_z=0.92 is achieved using KNN classifier for classification of malignant and benign ROI's of mammograms.

Index Terms—*Mammograms, Diffusion Wavelets, KNN classifier, Area Under the Curve(AUC)*

INTRODUCTION

Wavelets are powerful tools for analyzing mammograms. The class of functions that are used to localize an image in both space and scaling are called Wavelets[1], which are constructed from a function known as a mother wavelet that has a finite interval. A set of functions are generated through scaling and dilation operation on the mother wavelet that form an orthogonal or biorthogonal bases. Similar to the Fourier analysis any signal can be decomposed using the inner product of orthogonal or biorthogonal bases.

The inner product of the input functions with the dilated and scaled waveforms yields the transform coefficients. Therefore, the wavelet basis functions are useful for a localized representation of mammograms that fail to address the geometric structures on the surface without considering the mesh connection of the geometric model. However, the modes of structural variation can be constructed using a Laplacian graph, which is a graph space[2].

The Laplacian graph method can efficiently capture the shape variations of mammograms by embedding them in a vector space, whose dimensions span the modes of shape variations

Diffusion Wavelets proposed by Moggioni and Coifman[9] are based on compressed representation of dyadic powers of a diffusion operator T whose repeated application interacts with the underlying graph or manifold space.

The theory of diffusion polynomial that is constructed on a multiscale matrix based on orthonormal bases for the L_2 space of finite measure space is proposed by Maggioni and Mhaskar et. al.,[4]. Besov approximation functions that are defined in terms of suitable K-functional and frame transforms are used to study the approximation properties of the resulting multi-scale. The summability operator must be uniformly bounded for the development of diffusion polynomial.

The construction of wavelets based on compact differentiable manifolds proposed by Geller[5] can be done by defining scaling using the pseudo differential operator tLe^{-tL}

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where, t is a scale parameter and L is the manifold Laplace- Beltrami operator.

Wavelet transforms of functions on the vertices of an arbi-trary finite weighted graph proposed by Hammond et. al.,[6] is constructed by defining the scaling using graph Laplacian L. The scaled wavelet operator is defined as T_{tg}=g(tL), where g is the wavelet generating kernel and t is the scale parameter. Localization is a small scale limit that forms the spectral graph wavelets. A chebyshev polynomial approximation algorithm is used to compute the wavelet transform. However, the value of wavelet generating kernel g is not fixed and need to be optimized depending on the application. The other disadvantage is that the chebyshev polynomial may be used for large problems on unstructured yet sparse graphs.

Diffusion Wavelet packets generalize the classical wavelet packets and enrich the diffusion scaling function as well as wavelet bases. The construction of diffusion wavelet packets was done by anisotropic diffusion on a circle illustrating the effect of anisotropy on the structure of wavelet packets and applying Laplace-Beltrami diffusion operator T on a sphere. Flexible multiscale space-frequency analysis for the functions on the manifolds and graphs is allowed using diffusion wavelet packets.

The method of constructing an efficient representation of bases functions proposed by Mahadevan et. al.,[7] is based on two approaches, out of which the first approach is using the Eigen functions of the Laplacian which in turn performs a global fourier analysis on the graph. The second approach is based on generalizing the graphs by using multiscale dilations induced by powers of diffusion operator or by random walk on the graph.. A top down framework for multiscale analysis on manifolds and graphs is proposed by Szlam et. al.,[8].

The powers of the diffusion operator from finer scale to the coarser scale are used for dilation and the rank constraint to sample the multiresolution subspace are used for the construction of wavelets and wavelet packets in Euclidean space .

The dyadic decomposition of the Euclidean space can be done by the second Eigen function and the restriction of diffusion operator to functions is supported on each subdivided part. Local cosine packets on manifolds and generalized local cosines in Euclidean spaces are obtained by dyadic decomposition, which can be used for compression, denoising, approximation and learning of functions on a manifold. But, this algorithm requires n^3 oscillations making it expensive and slow.

A novel bottom-up construction that generalizes orthogonal diffusion wavelet in representing manifolds and graphs proposed by Maggioni et al.,[9] leads to biorthogonal diffusion wavelet. The orthonormal bases calculated in Diffusion Wavelet are less compactly supported since the input matrix T_j is obtained from the sums of the selected columns.

The multiscale analysis of Diffusion Wavelet on document corpora dataset was proposed by Maggioni and Coiffman et. al.,[10] by using scaling functions at various scales. A coherent as well as effective multiscale analysis of the space and functions on the space, can be done by Diffusion Wavelet that are a promising new tool in classification and learning tasks.

Based on the vast literature on the evolution and applications of Diffusion Wavelet, multiscale feature vectors are extracted from the mammograms of DDSM database. Many techniques have been proposed for classification of mammograms from DDSM database in the literature.

In this paper review of Diffusion Wavelet is described in the Introduction. The theory behind the Diffusion Wavelet and the algorithms used for application on mammograms was described . Calculation of statistical features from Diffusion Wavelet coefficients and experimental results are depicted. Conclusions are also presented explaining the superior performance of Diffusion Wavelet.

DIFFUSION WAVELET[3]

Diffusion Wavelet introduces a multiresolution geometric construction for the efficient computation of high powers of local operators. Diffusion Wavelets are constructed by considering Markov transition matrix T that enables fast computation of functions associated with greens function. The Markov transition matrix T is computed for an image. The matrix T can be compressed and orthogonalized to obtain coarser subspace T^{2j+1}. The dilations of dyadic powers of T produces smoothly bumped functions Φ_j known as scaling functions and smoothly localized oscillatory functions Ψ_j

known as orthogonal wavelets. These scaling functions and orthogonal wavelets comprise a diffusion

wavelet tree.

The diffusion operator T is self-adjoint which represents orthonormal basis.

A set of functions can be obtained from the columns of T based on the number of decomposition levels by local multiscale orthogonalization procedure, which is stored in sparse matrix of size NXN. This local multiscale orthogonalization procedure is achieved by QR factorization. The function which is the basis for subspace V_1 is coarser since they are the result of applying dilations to T . The orthogonal sub space of V_1 is W_1, whose basis function is Ψ_1 .

This procedure is repeated up to the specified number of decomposition levels. In order to obtain coarser and coarser basis functions Φ_j, the dyadic powers of T are down sampled. The three steps to construct a diffusion wavelet at each scale are Down sampling, Orthogonalization, Operator compression

Diffusion Wavelet Coefficients

Algorithm 1 explains the procedure for the extraction of coefficients from the mammograms. The mammograms were preprocessed and the noise present in the mammograms is removed using anisotropic diffusion without disturbing the edges and local structure of the mammogram. The anisotropic diffusion is governed by the factors, such as conduction parameter, gradient threshold parameter and the number of iterations. The anisotropic diffused image is shown in Figure 1. This diffused image with the largest scale parameter is then normalized by using Bimarkov function.

Algorithm 2 explains the procedure for obtaining diffusion scaling functions and Diffusion Wavelet functions when Bimarkov normalized kernel is given as an input to the Diffusion Wavelet. The wavelet basis function with respect to the initial basis must be represented by a Diffusion Wavelet function. Diffusion Wavelet coefficients are extracted from the Diffusion Wavelet functions which are then used for calculating features such as Mean, Standard Deviation, Kurtosis and Skewness

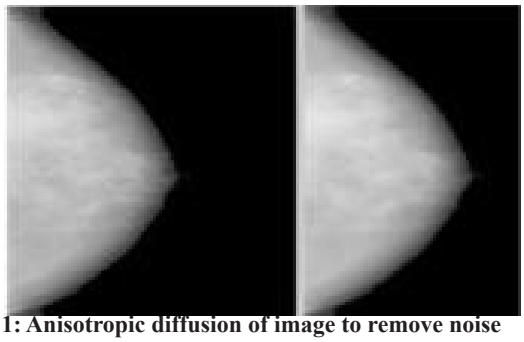


Fig. 1: Anisotropic diffusion of image to remove noise

Algorithm 1 An Algorithm to obtain Coefficients for a Mammogram

Input : Read Image
ad = anisodiff2D(im, num_iter, delta_t, kappa,option)
performs anisotropic diffusion on the input image
// Inputs:
// im : input image
// num_iter : number of iterations
// delta_t : integration constant set to maximum value
// kappa : is the gradient modulus threshold that controls the conduction
// option : conduction coefficient function chosen 1 for high contrast edges over low-contrast edges and 2 for wide regions over smaller ones.
// Output : diffused image with the largest scale space parameter.

[T, p]= Bimarkov (K, options)
// Computes the Bimarkov normalization function for the non negative symmetric kernel using an iterative scheme
// Inputs :
// K_m : an N X N matrix specifying a non- negative, symmetric kernel with nonzero row sums, which is the diffused image ad
// options : contains the maximum number of iterations, 100
// Output :
// Tb : Bimarkov normalized kernel
// p : column vector giving the Bimarkov normalization function

$Tree\left\{[\emptyset_j]_{\emptyset_0}, [\psi_j]_{\psi_0}\right\}$=$Diffusion\ Wavelet(T, \varepsilon, F_\theta, R_\theta, J, \kappa)$
This function generates bases and operators for a given diffusion operator
nlevel=size(Tree,1)

for i=1 to nlevel **do**
k=size(Tree{i,1}.ExtBasis,2)
Print the level and the number of Wavelet functions
end for

[F,coff] = DWBasisFcn(Tree, Level,Node,Index)
// This function represents a particular Wavelet packet basis function with respect to the initial basis.
// Inputs:
// Tree: Diffusion Wavelet tree
// Level: a scalar or vector giving the level or levels of the basis functions to extract
// Node: a scalar or vector giving the index of the node or the nodes
// Index : indices of the basis function
// Outputs:
// an MXN array specifying N basis functions

CoeffTree=DWCoeffs(Tree, Fcns)
Compute the coefficient of the given function in each of the subspaces represented in the given Diffusion Wavelet

EXPERIMENTAL RESULTS

A subset of DDSM[13] database is chosen for experimentation. From the total number of 2620 cases in the DDSM database, a total of 839 mammograms consisting of 396 malignant and 443 benign images are obtained.

The gallery of mammograms obtained from DDSM are shown in Figure 2. The mammograms of DDSM database are preprocessed to remove tape articrafts and noise. The Region of Interest (ROI) are extracted from these preprocessed mammograms as shown in Figure 3.

The Diffusion coefficients are obtained for 120 benign and 120 malignant preprocessed ROI's obtained from the mammograms. Mean, Standard Deviation, Skewness and Kurtosis are calculated for benign and malignant mammograms which are shown in Table I by using Diffusion Wavelet. The Lifting DWT in contrast to the DWT divides the signal to which prediction update operations are applied. The ease of construction, lower computational complexity and flexible adaptivity are the advantages of Lifting DWT.

Basic Lifting scheme for DWT proposed by Daubechies et. al.,[11] consists of three steps, i.e. splitting, predicting and updating. In splitting the signal is divided into even and odd arrays. Even array is then used to predict the odd array. The difference between the existing array and the predicted one is redefined as an odd array. Coarser coefficients can be obtained by updating the even array by using the filtered new odd array. Extraction of coefficients from mammograms by using the Lifting DWT have been proposed , which are used to calculate the statistical texture features[12].

Statistical features calculated using DWT, Lifting DWT and Diffusion Wavelet are shown in Table II for benign and malignant ROI's of mammograms which are classified using KNN based on 80-20 cross validation. Features of the Diffusion Wavelet are superior compared to DWT and Lifting DWT due to extraction of multiscale features from finer to coarser level.

A plot of ROC curve using Diffusion Wavelet, Lifting DWT and DWT is shown in Figure 4. Area Under the Curve(AUC) is 0.92 obtained by classifying the statistical features obtained from coefficients of the Diffusion Wavelet, which is higher compared to AUC using Lifting DWT and DWT.

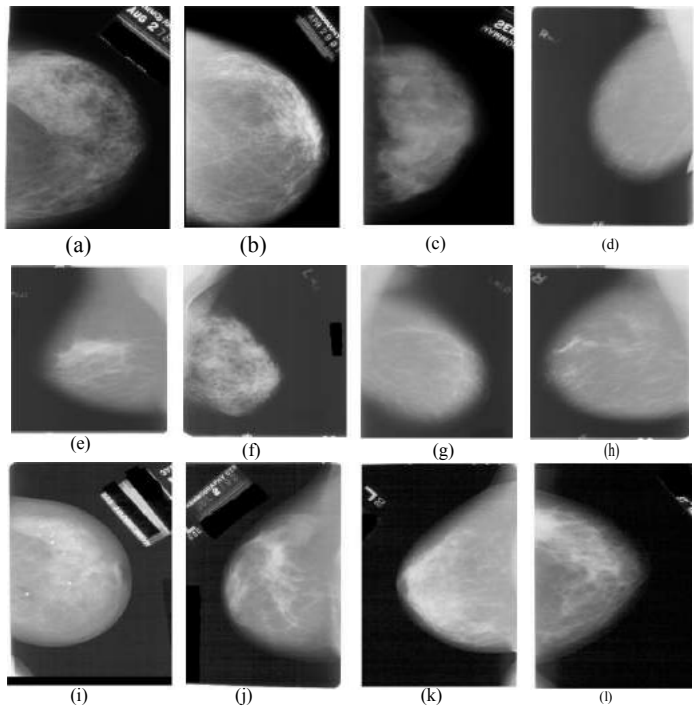
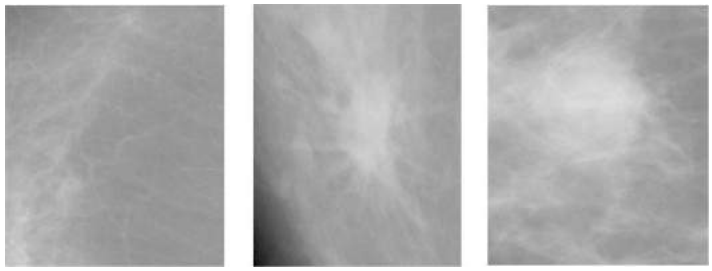


Fig. 2: Mammograms from DDSM database
(a),(b),(c),(d) Normal mammograms-A_002, A_0237, A_0366, B_3669 (e),(f),(g),(h) Benign mammograms-B_3114, B_3357, C_0321, B_3103 (i),(j),(k),(l) Malignant mammograms-A_1114, A_1486, A_1641, A_1730



a) b) c)

Fig. 3: ROIs extracted from mammograms of DDSM data base a) Normal A_1992_1.LEFT_CC.LJPEG b) Malignant A_1112_1.LEFT_CC.LJPEG c) Benign A_1688_1.LEFT_CC.LJPEG

TABLE I: Statistical Features Computed for Benign and Malignant mammogram using the Coefficients of Diffusion Wavelet

Feature	Benign	Malignant
Mean	2.89×10^{-5}	2.94×10^{-5}
Standard Deviation	68×10^{-5}	71×10^{-5}
Kurtosis	0.019	0.024
Skewness	2.98	3.14

TABLE II: Statistical features obtained for a mammogram using DWT, Lifting DWT and Diffusion Wavelet.

		Be-nign				Malignant		
Transform	**Mean**	**Standard**	**Kurtosis**	**Skewness**	**Mean**	**Standard**	**Kurtosis**	**Skewness**
		deviation				deviation		
DWT	$2.7X10^{6}$	$84.9X10^{6}$	0.245	3.726	$2.87X10^{6}$	0.007	0.09	3.44
Lifting DWT	0.66	0.13	0.43	2.09	0.62	0.03	0.44	3.69
Diffusion	3.29	9.26	8.33	2.64	5.55	15.67	8.36	2.64
Wavelet								

Algorithm 2 : An Algorithm to obtain Diffusion Wavelet Coefficients

$Tree\left\{\left[\emptyset_j\right]_{\emptyset_0}, \left[\psi_j\right]_{\psi_0}\right\}$=$Diffusion\ Wavelet(T, \varepsilon, F_\theta, R_\theta, J, \kappa)$

This function generates bases and operators for a given diffusion operator

// **INPUT**:

// T : Diffusion operator represented in the delta basis

// ε : Desired precision for modified Gram-Schmidt

// F_θ: Threshold for two column inner product in modified gramschmidt orthogonalization

// R_θ : Threshold for R component, which is obtained from modified gramschmidt orthogonalization

// J : Desired levels for scaling that terminates the program

// κ : When columns are less or equal to κ in extended diffusion scaling function

OUTPUT:

$[\emptyset_j]_{\emptyset_0}$: Extended diffusion scaling functions at scale j

// $[\psi_j]_{\psi_0}$: Extended diffusion scaling functions at scale j

// $[\emptyset_0] = I$; where I is the unit vector

for j=0 to J-1 **do**

$\left([\emptyset_{j+1}]_{\emptyset_j}, \left[T^{2j}{}_{\emptyset_j}^{\emptyset_{j+1}}\right]\right)$=QRgramschmidt$\left([T^{2j}]_{\emptyset_j}^{\emptyset_j}, \epsilon, F_\theta, R_\theta\right)$

$[\emptyset_{j+1}]_{\emptyset_0} = [\emptyset_{j+1}]_{\emptyset_j}\,[\emptyset_j]_{\emptyset_0}$

$[\emptyset_j]_{\emptyset_j}$ = QRgramschmidt$\left(I_{\emptyset_j} - \left[\emptyset_{j+1}\right]_{\emptyset_j}\left[\emptyset_{j+1}\right]_{\emptyset_j}^{T}, \epsilon, F_\theta, R_\theta\right)$

$[\Psi_{j+1}]_{\Psi_0} = [\Psi_{j+1}]_{\Psi_j}\,[\emptyset_j]_{\emptyset_0}$

$[T^{2j+1}]_{\emptyset_{j+1}}^{\emptyset_{j+1}} = [T^{2j}]_{\emptyset_j}^{\emptyset_{j+1}}$

end for

Computational cost of calculating the coefficients by using DWT, Lifting DWT and Diffusion wavelet is shown in Table III which indicates that the Diffusion wavelets diffuse at a faster rate compared to DWT and Lifting DWT.

CONCLUSION

In this paper DWT, Lifting DWT and Diffusion Wavelet explored on DDSM dataset. Diffusion Wavelet provides a fast multiscale dyadic decomposition of the mammograms from finer to coarser level.

Statistical texture features are calculated by using the coefficients of DWT, Lifting DWT and Diffusion Wavelet which are classified using KNN classifier. The Area under the Curve(AUC) using Diffusion Wavelet classified by KNN is found to be 0.92 emphasizing that the selection of classifier also plays a key role for the classification of benign and malignant ROI's of the mammograms.

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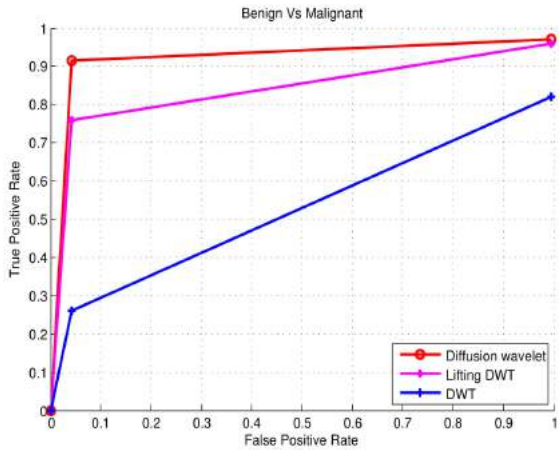

Fig 4: ROC curve for classification of Benign and Malignant mammograms

TABLE III: Computational cost for obtaining coefficients using DWT, Lifting DWT and Diffusion Wavelets from a mammogram

Transform	Computational Cost(in seconds)
DWT	1.56
Lifting DWT	1.91
Diffusion Wavelet	1.42

Ethical Clearance: Taken from the DEAN, Faculty of Engineering, ANU College of Engineering and Technology, Acharya Nagarjuna niversity and Department Research Committee (DRC) members to publish this work

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Two Phase Therapy for Skeletal Class II Malocclusion – A Case Report

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ABSTRACT

In the treatment of Class II malocclusion, treatment possessing the capability to alter patients' facial growth is of particular interest, namely by means of functional appliances, extraoral traction appliances, or a combination of both. There are certain clinical indications where functional appliances can be used successfully in class II malocclusion e.g. in a growing patient. The use of these appliances is greatly dependent on the patient's compliance and they simplify the fixed appliance phase. This is a case report of young growing male patient who had increased overjet and overbite, and an unaesthetic smile. The case was treated with Twin Block appliance followed by fixed appliance to detail the occlusion.

Keywords: *Functional appliance, twin block appliance, two phase therapy, Class II malocclusion.*

INTRODUCTION

Cass II Division 1 malocclusions are characterized primarily by the mandibular canines and molars in distal relationships relative to the corresponding maxillary teeth, as well as by protrusion of the maxillary anterior teeth.[1] The Class II malocclusion is a common malocclusion with a prevalence ranging between 5% and 29%.[2] Class II malocclusions can be treated by several means, according to the characteristics associated with the problem, such as anteroposterior discrepancy, age, and patient compliance. Methods include extraoral appliances, functional appliances and fixed appliances associated with Class II intermaxillary elastics. On the other hand, correction of Class II malocclusions in nongrowing patients usually includes orthognathic surgery or selective removal of permanent teeth, with subsequent dental camouflage to mask the skeletal discrepancy.

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Following is a case report of a young growing individual with mandibular retrognathia. Treatment was planned in two stages with the use of twin block during the first phase for correction of skeletal malocclusion and forward positioning of the mandible, followed by the second phase of fixed pre-adjusted edgewise orthodontic appliance for achieving a stable harmonious occlusion.

Case Report

A 13years-old male patient came to the Department of Orthodontics, MCODS, Manipal with the chief complaint of forwardly placed upper anterior teeth and unaesthetic smile. He was physically healthy and had no history of medical or dental trauma. No signs or symptoms of temporomandibular joint dysfunction or trauma were noted at the initial examination. Extra orally he had a mesoprosopic facial form, mesomorphic body type with a convex facial profile, without any gross asymmetry. Intra orally he had class II molar relation and class II canine relation on both sides, with an overjet of 8mm, and overbite of 7mm, caries in relation to 14, spacing of 3mm in the upper arch and 1.5mm in the lower arch. The Orthopantomograph confirmed the presence of all permanent teeth including the developing third molars. In the cephalometric assessment, the ANB value of 8° suggested a class II skeletal pattern. The

vertical proportions were within normal value. The upper incisors were proclined at 115° and the lower incisors were of average inclination at 95°. The interincisal angle was reduced at 120. The lower incisor to APo and the lower lip to E line were reduced by 1mm and 2mm respectively. Skeletal maturation evaluation using Cervical vertebrae shows the acceleration stage, means growth acceleration begins at this stage with 65%-85% of adolescent growth expected (Fig.1).

Visual Treatment Objective was positive; So, a treatment plan involving mandibular advancement with a twin block was considered.

Treatment objectives

The main objectives for phase I of the treatment were as follows:

1. Reduce the overbite and overjet.

2. Achieve class I canine and molar relationship and gain anchorage.

3. Enhance facial esthetics

In phase II of the treatment, the aims were:

1. Level and align the arches.

2. Closure of spacing in both upper and lower arches.

3. Finishing and detailing

Treatment rationale

Phase I of treatment involved the use of functional appliance (Clark Twin Block appliance) to reduce the overjet, achieve class I molar relationships and gain anchorage at the start of treatment to simplify the fixed appliance stage (Fig. 2). Furthermore, there is the theoretical advantage of improving the patient's profile by causing a small skeletal change (O'Brien et al., 2003b). This phase was followed with upper and lower fixed appliances (0.02200 slot brackets) to close spaces, detailing and finishing of the case.

Treatment progress

The aims of the functional treatment phase were achieved successfully due to good patient compliance. This phase of treatment was completed over 9 months. The upper incisors were retroclined by 2° while the lower incisors proclined by 4°. This resulted in reduction of the overjet.

The second phase of treatment with the fixed appliances aimed to close the remaining spaces and finish the case which lasted 10 months. The overall treatment time was 21 months i.e. 9 months functional appliance wear, 2 months transient phase between functional and fixed and 10 months fixed appliance treatment.

The case was debonded after 10 months of active treatment. Upper Hawley's retainer and lower lingual bonded retainer from canine to canine were given.

Treatment results

The treatment objectives were achieved. The profile of the patient has improved after the treatment. The spaces of the upper and lower arches were closed during the fixed appliance phase of treatment. The incisor, canine and molar relationships were class I at the end of treatment (Fig.3). The overbite and overjet were reduced to the average values. The overall changes are tabulated in Table 1.

Table 1: Shows Pre & Post treatment Cephalometric findings

Variable	Normal	Pre-treatment	Post-treatment
SNA	82° ± 3	86°	84°
SNB	79° ± 3	78°	82°
ANB	3° ± 1	8°	2°
Upper incisor to maxillary plane angle	108° ± 5	115°	112°
Lower incisor to mandibular plane angle	92° ± 5	95°	99°
Interincisal angle	133° ± 10	120°	125°
Maxillary-mandibular plane angle	27° ± 5	29°	31°
Face height ratio	55%	54%	57%
Lower incisor to Apo line	0-2mm	-1mm	1mm
Lower lip to Rickett's E plane	-2mm	-4mm	-2mm

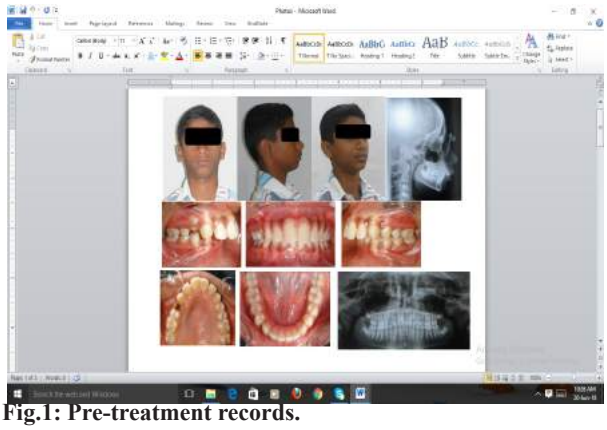

Fig.1: Pre-treatment records.

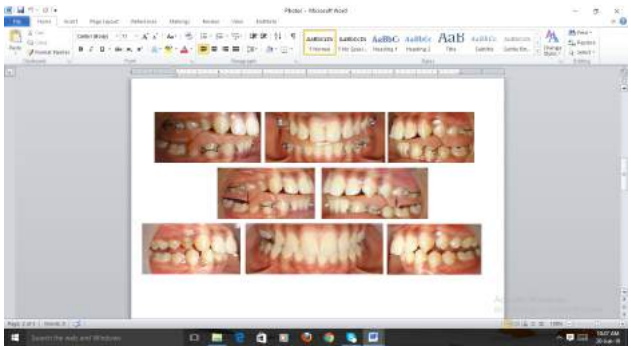

Fig.2: Treatment progress- with Twin block, trimming and after twin block.

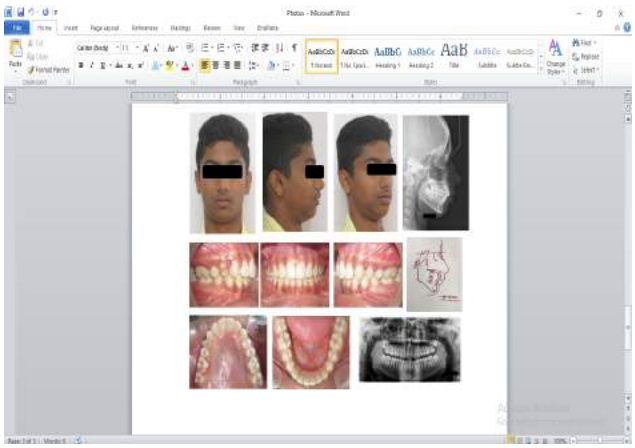

Fig.3: Post-treatment records.

DISCUSSION

Twin Block functional appliance has several well established advantages including the fact that it is well tolerated by patients, robust, easy to repair and it is suitable to use in the permanent and mixed dentition.[3,4] There are potential disadvantages such as the proclination of the lower incisors and development of posterior open bites. In this case, the treatment objectives were achieved largely due to the good compliance by the patient. The patient's chief complaint was the increased overjet. Thus by reducing the overjet with the functional appliance, the patient's confidence has improved and also the risk of sustaining trauma to the upper incisor was minimised.[5]

During treatment, the SNA value was reduced by 2° while the SNB value increased by 4°. As a consequence the ANB value decreased by 6° towards class I skeletal pattern. The maxillary mandibular plane angle remained relatively unchanged. The upper incisor inclination reduced to 112°. The lower incisors were proclined by 4°. The vertical proportions increased during treatment. The lower incisors to the APo line and the lower lip to the E plane were increased by 2 mm. This has resulted in improvement in the patient's profile which is largely attributed to the favourable growth and may be partly due to the functional appliance.

CONCLUSION

The use of Twin- block in Class II therapy not only corrects the malocclusion, but is also effective in improving the soft tissue profile and the intermaxillary relationship. Early treatment can eliminate etiologic factors such as sucking habits, restoring normal growth and reducing the severity of skeletal abnormalities. Once the growth period is over, treatment options become more limited.

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Conflict of Interest: Nil

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In Vitro Study of Antimicrobial Activity of *Lactobacillus Fermentum* against Germ Tube Positive *Candida* spp

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ABSTRACT

Background and Purpose: *Lactobacilli* are involved in the microbial homeostasis in the gastrointestinal tract and female genital tract. Due to the high prevalence of fungal and bacterial infections of the female genital tract and the emerging resistance of microbial pathogens to various antimicrobial agents, alternative measures to control these infections are increasingly felt by the scientific community. *Lactobacillus* was considered as probiotic used in controlling some bacterial infections because of the property of *Lactobacillus* exhibiting antimicrobial activity and thus augmenting the therapy by antimicrobial drugs.

Material and method: Many studies were undertaken to evaluate the probiotic properties of *Lactobacillus* against *germ tube positive Candida spp*. namely *C.albicans* & *C. dubliniensis*. The probiotic potential was investigated by using the following criteria: (i) adhesion to host epithelial cells and mucus,(ii) biofilm formation, (iii) co-aggregation with bacterial pathogens,(iv)inhibition of pathogen adhesion to mucus and HeLa cells, and (v) antimicrobial activity. Documented studies reveal *lactobacilli* adhered to mucin, co-aggregated with all genital microorganisms, and displayed antimicrobial activity. *L. fermentum* produced a moderate biofilm and a higher level of co-aggregation and mucin binding. The displacement assay demonstrated that all *Lactobacillus* strains inhibit *C.albicans* & *C.dubliniensis* binding to mucin ($p < 0.001$), likely due to the production of substances with antimicrobial activity.

Results: In this study Clinical isolates of *C.albicans* & *C.dubliniensis* associated with vaginal candidiasis were inhibited by *L. fermentum*. Our data suggest that *L. fermentum* isolated from two days fermented goat milk is a potential probiotic candidate, particularly to complement candidiasis treatment.

Conclusion: *Lactobacillus fermentum* isolated from two days fermented Goat milk had good effect preventing the growth of Germ tube positive *Candida species* (*Candida albicans* and *Candida dubliniensis)*.

Keywords: *Candida albicans, Candida dubliniensis, Vitek-II compact system, and YST, YS02 (BIOMERIX IN INDIA)*

INTRODUCTION

Candida albicans is an opportunistic fungal pathogen that is responsible for candidiasis in human hosts. *C.albicans* grow in several different morphological forms, ranging from unicellular budding yeast to true hyphae with parallel-side wall.[1] Typically, *C.albicans* live as harmless commensal in the gastrointestinal and female genitourinary tract and are found in over 70% of the population. Overgrowth of these organisms, however, will lead to disease, and it usually occurs in immunocompromised individuals, such as HIV-infected victims, transplant recipients, chemotherapy patients, and low birth-weight babies.[2] There are three major forms of disease: oropharyngeal candidiasis, vulvovaginal candidiasis, and invasive

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candidiasis. Over 75% of women will suffer from a *C. albicans* infection, usually vulvovaginal candidiasis, in their lifetimes, and 40-50% of them will have additional occurrences(s). Interestingly, *C.albicans* is considered as one of the leading cause for nosocomial infections in patientsundergoing treatment for metabolic disorders, severe systemic bacterial infections, and immunocompromised pateients. This *Candididial* infection could result in an extremely life-threatening, systemic infection in hospital patients with a mortality rate of 30%.[3] *Candida dubliniensis* is also germ tube-positive yeast which has been recovered primarily from the oral cavities of human immunodeficiency virus (HIV)-infected individuals and AIDS patients.[4]*Candida dubliniensis* was first described in 1995 from oral cavities of human immunodeficiency virus (HIV)-infected individuals. The species forms only a minor component of normal microbiota but has a worldwide distribution. Despite its close relationship with *C. albicans*, which is the predominant pathogenic species, the etiopathologic role of *C.dubliniensis* has mostly been restricted to oral candidiasis. In recent years, however, *C. dubliniensis* has increasingly been reported from patients with candidemia. Although the species is significantly less than *C. albicans*, the reasons for its expanding role in invasive disease remain largely unknown.[5]

In women of childbearing age, the vaginal ecosystem is dominated by *Lactobacillus* spp.[6] These microorganisms can prevent the colonization of the urogenital tract by pathogens and they are important for women's reproductive tract health.[7] *Lactobacilli* modulate the vaginal microbiota by different mechanisms such as: (i) auto-aggregation, (ii) production of lactic acid, hydrogen peroxide, bacteriocins, and biosurfactants, (iii) co-aggregation with pathogenic microorganisms, and (iv) adhesion to epithelial cells. Vulvovaginal candidiasis is the most prevalent vaginal infections worldwide. Vaginal thrush is responsible for up to 50% of all the cases of vaginal infections and it is characterized by a significant reduction in lactobacilli population, and increase in facultative aerobic and anaerobic pathogens.[8]

AIM

The aim of this research was to study the Invitro effect of *L.fermentum*, isolated from two days fermented goat milk, against Germ tube positive *Candida* spp. (*C. albicans* and *C. dubliniensis*) causing Vulvovaginal *candidiasis infection.*

MATERIAL AND METHOD

1. Isolation of *C. albicans* and *C. dubliniensis* from clinical specimens

A. Collection of samples

In total 135 High vaginal swabs samples were collected from Tertiary care Hospital, Pondicherry. Samples were aseptically collected and processed.

B. Culture and Identification of Germ tube positive *Candida* spp.

Vaginal swabs were collected with aseptic precautions and immediately inoculated onto Sabouraud dextrose agar & Candida chrome agar media (CHROMOGEN IN INDIA) and incubated at 37^0c for 24hrs. After incubation, identification of Candida from positive cultures was done with standard microbiological techniques which includes AES *Biomerix* (Vitec-II Campact system)in India, Grams stain, biochemical reactions.[11]

Fig-1. ***Candida albicans*** **in Candida chrome agar**

C. Confirmation of Germ tube positive Candida species

Germ Tube Test is a screening test which is used to differentiate *Candida albicans* from other yeast. Germ tube (GT) formation was first reported by Reynolds and Braude in 1956. When *Candida* is grown in human or sheep serum at 37°C for 3 hours, they forms a germ tubes, which can be detected with a wet KOH films as filamentous outgrowth extending from yeast cells. It is positive for *Candida albicans* and *Candida dubliniensis.* Approximately 95 – 97% of *Candida albicans* isolated develop germ tubes when incubated in a proteinaceous media.

D. Principle of Germ Tube Test

Formation of germ tube is associated with increased synthesis of protein and ribonucleic acid. Germ tube is one of the virulence factors of *Candida albicans*. This is a rapid test for the presumptive identification of *C. albicans.*

E. Procedure of Germ Tube Test

Place 0.5 ml of sheep or human serum into a small tube. *Note: Fetal bovine serum can also be used instead of human serum.*

Using a Pasteur pipette, touch a colony of yeast and gently emulsify it in the serum. *Note: Too large of an inoculum will inhibit germ tube formation.*

Incubated the tube at 37°C for 2 to 4 hours.

Transfer a drop of the serum to a slide and place cover slip for examination.

Examine microscopically under low power and high power objectives.

F. Results and Interpretation of Germ Tube Test

Positive Test: A short hyphal (filamentous) extension arising laterally from a yeast cell, with no constriction at the point of origin. Germ tube is half the width and 3 to 4 times the length of the yeast cell and there is no presence of nucleus. **Examples:** *Candida albicans* and *Candida dubliniensis*

Negative Test: No hyphal (filamentous) extension arising from a yeast cell or a short hyphal extension constricted at the point of origin. **Examples:** *C. tropicalis*, *C. glabrata* and other yeasts.

G. Quality Control in Germ Tube Test

Positive Control: *C. albicans* (ATCC 10231)

Negative Control: *C. tropicalis* (ATCC 13803), *C. glabrata* (ATCC 2001)

H. Limitations of Germ Tube Test

1. C. tropicalis may form early pseudohyphae which may be falsely interpreted as germ tubes.

2. The yeast formerly named *Candida stellatoidea* also produces germ tubes; however, it has been combined with *C. albicans* and no longer exists as separate species.

3. This test is only part of the overall scheme for identification of yeasts. Further testing is required for definite identification.[9]

2. *Lactobacillus* isolation from fermented Goat milk

A. Isolation and Identification *Lactobacillus* from 2 days fermented goat milk:

Two days fermented goat milk was serially diluted in saline (0.85%) and 100 µl of each dilutions (10-1 to 10-6) were spread plated onto MRS (De Man Rogosa and Sharpe) to isolate the Lactobacillus spp. Plates were incubated at 37°C for 48 - 72 h at anaerobic conditions.[10] Isolates were identified on the basis of growth, cell morphology, gram staining and catalase activity. Further, identification was performed according to carbohydrate fermentation patterns and growth at 15°C and 45°C in the MRS broth based on the characteristics of the *lactobacilli* as described in Bergey's Manual of Determinative Bacteriology and also through molecular technique 16s rRNA sequencing.[11] The lactobacilli grown on solid MRS medium was inoculated in liquid MRS medium, and after 24hour liquid MRS broth was removed and transferred to another fresh MRS broth, in order to strengthen the growth of lactobacilli.[12]

B. Quality control reference of the Lactobacillus isolates

For QC reference, *Lactobacillus strains* (ATCC NO:9224) was considered

C. Antimicrobial Activity Determination

Using a sterile swab, *Candida albicans* and *Candida dubliniensis* adjusted to 0.50 to 3.00 McFarland dilutions were inoculated into the surface of the Sabuards dextrose agar plates. On the surface of SDA plates, holes 5 mm in diameter and depth were created under sterile conditions using a Pasteur pipette. The MRS broth containing *Lactobacillus fermentum* was centrifuged at 6000 rpm for 10 minutes. Concentration of *Lactobacilli* adjusted to six different concentrations (100000 IU, 150000 IU, 200000 IU, 250000 IU, 300000 IU, and 350000 IU). Then 100 µg of solution of each concentration of *lactobacilli* was poured into a separate well. Plates were kept in the refrigerator for 2 hours

until the liquid was absorbed, then transferred into the incubator and incubated for 14 to 15 hours at 37°C. After incubation, the diameter of the inhibition zones (mm) around the well was measured using a ruler.[13] The antagonistic effect of lactobacillus fermentum against Candida spp. was interpreted on the bases of inhibitory growth zones as follows.[14]

Inhibitory growth zones were interpreted as follows: negative (−) at <11 mm; medium (+) at 11–16 mm; strong (++) at 17–22 mm; very strong (+++) at >22 mm.

RESULTS

Among the 135 samples, a total of 66 were *Candida* positive. Out of these 38 isolates were identified as *Candida albicans* and 13 *Candida dubliniensis* remaining 15 are non germ tube positive *Candida* species. In this study *Lb. fermentum* had shown antagonistic properties on germ tube positive *candida* species. It was observed that *Lactobacillus* had a significant antagonistic effect on *Candida albicans* and *Candida dubliniensis.* (Table 1) & (Table 2).

Table-1: Zone of inhibition of *Candida albicans*

C.albicans turbidity in MaC forland	**Lactobacillus fermentum**					
	100000IU	**150000IU**	**200000IU**	**250000IU**	**300000IU**	**350000IU**
0.50	20mm	28mm	33mm	40mm	42mm	>45mm
1.00	18mm	23mm	29mm	32mm	36mm	39mm
1.50	15mm	21mm	26mm	28mm	30mm	36mm
2.00	13mm	19mm	21mm	23mm	27mm	31mm
2.50	08mm	13mm	15mm	18mm	22mm	27mm
3.00	R	7.5mm	11mm	13mm	17mm	20mm

Inhibitory growth zones were interpreted as follows: negative (−) at <11 mm; medium (+) at 11–16 mm; strong (++) at 17–22 mm; very strong (+++) at >22 mm.

Table: 2 Zone of inhibition *Candida dubliniensis*

***Candida dubliniensis* Turbidity in MaC forland**	**Lactobacillus fermentum**					
	100000IU	**150000IU**	**200000IU**	**2.50000IU**	**300000IU**	**350000IU**
0.50	24mm	32mm	36mm	39mm	42mm	>48mm
1.00	22mm	28mm	32mm	37mm	44mm	45mm
1.50	19mm	23mm	28mm	33mm	37mm	43mm
2.00	16mm	20mm	24mm	30mm	31mm	41mm
2.50	11mm	17mm	19mm	27mm	29mm	38mm
3.00	9mm	12mm	18mm	22mm	24mm	30mm

Inhibitory growth zones were interpreted as follows: negative (−) at <11 mm; medium (+) at 11–16 mm; strong (++) at 17–22 mm; very strong (+++) at >22 mm.

DISCUSSION

Literature evidence suggest the production of organic acids helps to keep the vaginal pH below 4.5 and creates a hostile environment for the growth and survival of pathogenic microorganisms.[15] The highest amount of lactic acid was produced by L.fermentum. Hydrogen peroxide is another antagonistic compound produced by lactobacilli and its production is normally assessed by using qualitative methods, such as incorporation of the peroxide in agar medium and revelation by addition of tetramethylbenzidine.[16] However, quantitative results may help to better understand the role of H_2O_2 in healthy and infected vaginal environments. [17] H_2O_2 is converted to reactive oxygen species (ROS) such as superoxide anions, hydrogen peroxide and hidroxyl free radicals that are highly toxic against several microorganisms.[18] Besides that, lactobacilli keep a high oxireduction potential in the vaginal environment, which inhibits multiplication of strictly microorganisms.[15] Some vaginal Lactobacillus species are capable of synthesizing antimicrobial peptides known as bacteriocins.[19] Osset et al.[20] Studied the production of bacteriocin by several Lactobacilli isolates against C.albicans and C.dubliniensis when agar plate method was used. Conclusion

Lactobacillus fermentum isolated from two days fermented Goat milk exhibitted good effect of preventing the growth of Germ tube positive Candida species (*Candida albicans* and *Candida dubliniensis) grown on* Sabouraud dextrose agar.

Ethical Clearance: Taken from Institutional Ethics Committee (Human Studies) Ref. no. IEC/C-p/49/2014.

Conflicts of Interest : The authors of the current study declare no conflicts of interest.

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Effect of Auditory Verbal Working Memory Training on Speech Perception in Noise in Older Adults

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ABSTRACT

Background: Older adults exhibit poor speech perception in noise due to poor spectral, temporal and cognitive processing. According to "ease of language understanding model" good working memory capacity is required to compensate for aberration in peripheral auditory processing so that optimum level speech of understanding can be maintained. However, there is no consensus on the effect of enhanced working memory capacity through auditory training on speech perception. Hence, the effect of working memory training on speech perception in noise in older adults needs to be investigated.

Objective: To investigate the effect of auditory verbal working memory training on speech perception in noise in older adults.

Method: The present study involved a "two groups, nonrandom selection, pre-test, post-test" study design. Twenty-nine normal hearing older adults within the age range of 61-80 years and 14 of them formed the control group, and 15 of them formed an experimental group. In Phase, I of study, working memory ability and speech perception in noise (SNR-50) were assessed in both the groups. In Phase II the participants in the experimental group were trained using working memory training module. In the last phase of the study, working memory, and SNR-50 were reassessed. Then the pre and post-training scores were compared in both groups.

Results *:* Wilcoxon's signed rank test revealed that working memory training had positive effect on working memory ability and SNR-50.

Conclusions: Working memory training can improve working memory capacity which can in turn improve speech perception in noise.

Keywords: *Older adults; working memory capacity; digit backward recall; stroop task; SNR50*

INTRODUCTION

One of the growing concerns among elderly individual is age related changes in sensory abilities. Age related changes in auditory processing and also called as "auditory aging" starts as early as the fourth decade onwards [1]. A pervasive characteristic of aging is an inability to understand speech particularly in the presence of background noise or reverberation [2]. Studies have shown that older adults have more difficulty in understanding speech compared to younger adults even when they are matched to hearing acuity [3] and for the ability to understand speech in quiet [4,5]based both peripherally and centrally, has been an important topic of hearing research for several decades. In this review, recent investigations are classified into five problem areas: the prevalence and temporal progression of IAIA

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and their relation to presbyacusic sensorineural hearing loss; the deficit of speech understanding in aging; other auditory abilities affected by age; the etiology of IAIA; and the rehabilitation of auditory functions in the elderly. The work reviewed bears witness to a vigorous current worldwide interest in these questions by researchers in various disciplines. The intense research effort, however, is in contrast with the low prevalence of hearing aid use by the elderly with auditory handicap.(C. Possible reasons for poor speech perception could be a decline in auditory temporal, spectral and cognitive processing. Additionally, the aging process reduces the working memory ability [6,7]a key determinant of many higher-order cognitive functions, declines in old age. Current research attempts to develop process-specific WM training procedures, which may lead to general cognitive improvement. Adaptivity of the training as well as the comparison of training gains to performance changes of an active control group are key factors in evaluating the effectiveness of a specific training program. In the present study, 55 younger adults (20-30 years of age. Due to poor storage capacity [8], elderly listeners may not be able to hold the necessary information's required to understand speech resulting in poor speech perception abilities. Since older adults have working memory deficits, they are also more susceptible to the distracting effects of background noise resulting in poor speech perception in noise [9]. The contribution of working memory to speech perception in noise can be best explained using Ease of Language Understanding (ELU) model [10]. This model assumes that speech perception is a result of implicit and explicit information processing. When a clean speech signal is presented, phonological matching to memory representations occurs rapidly, and speech understanding takes place implicitly. However, when the target speech is corrupted by background noise, matching to phonological representations does not occur rapidly. Hence implicit processing fails, and explicit processing is needed. Explicit processing utilizes the working memory resources to repair the misunderstandings and loss of information's caused by background noise. In older adults, implicit processing of speech in noise is affected because of degradation of target speech by noise and poor auditory processing [11]. Hence, there is higher demand for explicit processing. According to this model, good working memory capacity is required to compensate for aberration in peripheral auditory processing so that optimum level speech of understanding can be maintained. However, less empirical evidence is available for supporting this hypothesis. Hence, effect of working memory training on speech perception in noise in older adults needs to be investigated. Few attempts have been made to study the effect of working memory training on speech perception in noise in young adults [6] and in individuals with hearing impairment [12]. However, the assessment and training procedures are not available in the Kannada language and also the assessment and training of verbal working memory is mostly language dependent. Hence, it is essential to investigate the effect of auditory working memory training (in Kannada language) on speech perception in noise in Kannada speaking older adults.

METHOD

Participants

The present study involved "two groups, nonrandom selection, pre-test, post-test" study design. The study protocol was approved by institutional ethical committee of Kasturba Medical College, Mangalore. Twenty-nine normal hearing older adults within the age range of 61-80 with the mean age of 66.8 years participated in the current study. The participants who were native speakers of Kannada possessing the pure tone thresholds ≤25dBHL at audiometric octave frequency from 250Hz to 4 KHz and also a score ≥26 on mini mental status examination (MMSE) were included in the study. The participants were then divided into two groups using block random sampling method (1) Control group (2) Experimental group, with 15 in experimental group and 14 in control group. An informed consent was obtained from all the participants prior to the conduction of the study.

Procedure

In phase I, the working memory ability and speech perception in noise were assessed in all the participants of both the groups. The working memory ability was assessed using digit backward recall (DBR) and stroop task. In phase II of the study, experimental group was subjected to working memory training. The training was carried out for duration of two weeks. In phase III, working memory ability and speech perception in noise were reassessed in both the groups.

Experimental tasks

Stroop task.

Two speech tokens /gʌnɗʌsu/ and /heɳʌsu/ meaning

male and female respectively spoken by both male and female in Kannada were recorded and used. Congruent trials consisted of the word "/gʌndʃʌsu/" spoken by male speaker, and the word "/heŋʌsu/" spoken by the female speaker. In contrast, incongruent trials consisted of the word "/gʌndʃʌsu/" spoken by a female speaker and the word "/heŋʌsu/" spoken by the male speaker. Twenty congruent trials and twenty incongruent trials were presented to all the participants. Participants were asked to respond as quickly as possible by pressing the right arrow key whenever they heard a male voice and left arrow key whenever they heard a female voice. The reaction time for every correct response for all the four conditions was noted and averaged.

Digit backward recall task

Numbers from 1-9 excluding 2 and 9 in Kannada spoken by the female speaker was recorded. These tokens were presented randomly in sequential order with interstimulus interval of 250 sec. Participants were asked to repeat the series of spoken digits in the backward order. The test began with a span length of 3 digits and progressed until a particular span length was repeated incorrectly. With every correct response, the series increased in number till the participant responded incorrectly, following which the length decreased by 1 step. The procedure was terminated after four consecutive trials. If the reversal ended with a correct response, it was taken as the score, if it ended with an incorrect response; the final correct response was taken as the score.

Speech perception in noise (SNR50).

QuickSIN protocol was used to estimate speech perception in noise. The target signal was kept constant whereas the root mean square amplitude of noise (4 talker speech babble- 2 males and 2 females) was varied to form sentences with varying Signal to Noise Ratio (SNR), ranging from +20 to -10dB. Two lists of Kannada QuickSIN, containing seven sentences in each list were used. In each list the first sentence was presented at +20 dB SNR and the SNR was reduced in 5 dB steps for the subsequent sentences. Thus, the last sentence was presented at -10 dB SNR. Each listener's task during the test was to repeat the sentences presented. Each participant was instructed to listen carefully and repeat the word. They were told to guess, if necessary. Each correctly repeated word was awarded one point for a total possible score of 35 points per list. Further, using Spearman and Karber equation, total score was converted into SNR50. Finally, SNR-50 of both the lists was averaged.

Training Procedure

Participants in the experimental group underwent training intended to enhance verbal working memory. The training phase consisted of 4 levels. Level I consisted of three word meaningful sentences e.g., /nal̥ɛɪnɖa ʃalɛgɛ rʌdʒɛ/; Level II consisted of four word meaningful sentences, e.g., /na:vu ɛla:ronɖɻɛ ʌdʒi mʌnɛgɛ hoguʈɛvɛ/; Level III consisted of five word meaningful sentences, e.g.,/ɪnɖɻ nʌnʌgɛ ʃalɛjʌli bʌhuma:nagʌlu ɖorʌkuʈʌɖɻɛ/ Level IV consisted of six word meaningful sentences, e.g.,/a: ɖɻna bʌhal̥a mʌl̥ɛja:guɖʌnu ba:lʌkɪju noduʈɪɖʌl̥u/. In the first session participants were presented 15 sentences from the level I through the headphone. The instructions given included- (1) Repeat the sentence in the reverse order; (2) Repeat the sentence in the order of word length; (3) Tell the number of syllable in the given word and further tell the syllable in the reverse order. Following the response given by the participant for an instruction, subsequently, the next instruction would follow. Subsequent levels were followed in the similar fashion. The training was terminated at level IV which included six word sentences.

Participants were also trained for selective attention using stroop stimulus. Two speech token "/bʌlʌ kɪvɪ/" and "/ɛda kɪvɪ /" were used for stroop task. The token "/bʌlʌ kɪvɪ/"and "/ɛda kɪvɪ/" mean right ear and left ear respectively in Kannada language. The tokens were presented randomly in one of the ears. Ten congruent and ten incongruent trials were presented. The participants were instructed to press "/bʌlʌ kɪvɪ/" on the screen if the word was heard in the right ear, and "/ɛda kɪvɪ/" if it was heard in the left ear irrespective of the word presented. The duration for which response token was available on the screen was controlled, and the participants were trained for the response token duration within 4 seconds initially, the timings were further reduced to 3seconds once the responses in the 4 seconds were stabilized. The same was carried out for 2 seconds and 1second.

Instrumentation

The stimuli for experiments were presented from Acer Aspire one E 15 laptop. Psychopy2 version 1.77.01 software was used to generate and present the stimulus

for the stroop task. Output of the laptop was routed through 24-bit Creative sound blaster X Fi USB2 sound card. TDH-39 headphone with circum-aural PELTER earmuffs was used to present the stimuli for experimental procedures.

RESULTS

Stroop Task

Wilcoxon Signed rank test revealed a significant main effect of training on stroop reaction time in the experimental group (Z= -2.329, p=.020). Difference in stroop reaction time between pre-test and post-test session was significant even in the control group (Z= -2.669, p=.008). Stroop reaction time was reduced in post-training session when compare to pre-training session in experimental group. Stroop reaction time was reduced in post-test when compare to pre-test even in control group. However, the reduction in stroop reaction time was larger for experimental group. Median values for stroop reaction time for both groups is represented in Figure 1.

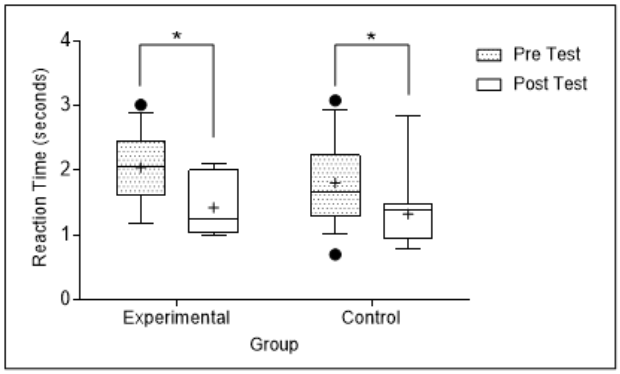

Figure1: whiskers represent median and 10th to 90th percentile values of stroop reaction time.

Digit Backward Recall Task

Wilcoxon Signed rank test was used to investigate the pre-post training effect on DBR. Analysis showed no significant difference in digit backward recall span length (Z= -2.828, p=.530) on pre-post-test in control group. However, significant main effect of training on DBR was seen in experimental group (Z= -1.414, p=.331). DBR improved following training in experimental group. Median values for DBR task for both experimental and control group is represented in Figure 2.

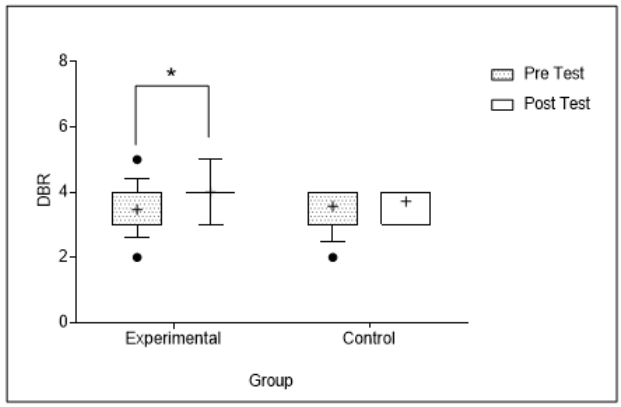

Figure 2: whiskers represent median and 10th to 90th percentile values of stroop reaction time.

SNR-50

To investigate if there is significant main effect of WM training on SNR-50, Wilcoxon Signed rank test was used. The analysis in the experimental group revealed that, there was significant main effect of training on SNR-50 (Z= -2.50, p=.012). SNR50 of individuals in experimental group was significantly improved following working memory training. However, comparison of pre-test and post-test SNR 50 in the control group revealed no significant difference (Z= -.33, p=.739). Median values for SNR-50 for both experimental and control group is represented in Figure 3.

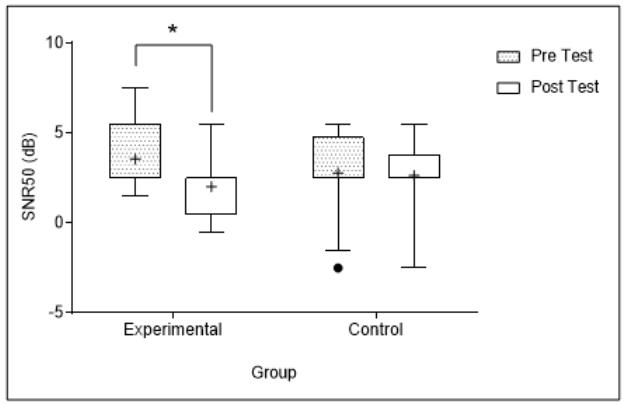

Figure 3: whiskers represent median and 10th to 90th percentile values of stroop reaction time.

DISCUSSION

The positive effect of working memory training on DBR, stroop reaction time and SNR-50 can be explained using transfer effects - near and far transfer effects. In the present study the positive effect of training on DBR and Stroop task can be attributed to near transfer effect, as the tasks used for training was similar to DBR and Stroop tasks. Earlier studies also have shown the presence of near transfer effect but absence of far transfer effect of

working memory training in older adults [13–15]young-old (65-74 years. Similarly, near transfer effect of working memory training on complex span task is also reported [15]. However, Schmiedek[16] reported a far transfer effect too in older adults. Transfer effect seen in the current study can be probably due to plastic changes in the brain following training. For the Transfer effect to take to place, training procedure and outcome assessment procedure should share some common neural mechanism[17].

One important observation in the current study is that, working memory training had improved SNR50 indicating a possible far-transfer. Similar far transfer effect of short term working memory training on SNR50 was reported in young adults [18]. Improvement in SNR50 following working memory training can be explained with the help of Ease of Language Understanding (ELU) model [10,19]. According to ELU, poorly defined speech sound representations leads to mismatch in phonologically challenging tasks and to resolve this mismatch, increased working memory capacity is essential. When the speech signal is corrupted by noise, automatic matching of each syllable of the input signal to stored representations in long-term memory fails. Hence, working memory plays a major role decoding the information from the noise corrupted signal. As per this framework if, an individual's working memory is enhanced there can be improvement in speech understanding in noise. In the current study, working memory training has enhanced working memory capacity which would have led to better SNR50 in older adults. The training related enhancement in speech perception could be also because of facilitation of individuals' ability to inhibit distracting information such as background noise. It has been observed that several cognitive abilities, such as attention and inhibition, are thought to interact with WM [20].

CONCLUSION

Working memory training can improve working memory capacity which in turn improve speech perception in noise.

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Cognitive Functions after Neonatal Encephalopathy in a Coastal City of South India-A Retrospective Cohort Study

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ABSTRACT

Background: Cognitive impairment either with presence or absence of neuromotor disability is a pertinent issue after neonatal encephalopathy (NE).

Aims and objectives: To assess motor and cognitive functions in survivors of NE and to correlate them with NE clinical scoring/staging.

Methodology: A hospital based retrospective cohort study was conducted at a tertiary teaching medical college hospital. Medical records were studied and survivors of term neonates with NE that were managed in the neonatal intensive care unit (NICU) were considered as cases. Children born as term babies during the same period requiring no intensive care were taken as controls. A onetime follow up of study subjects at 6 – 8 years of age was carried out to assess the motor and cognitive function by standard tests. Data was entered and analyzed by SPSS Version 11.

Results: As per Millers encephalopathy scores, majority (52.6%) had an encephalopathy score of one. Seventeen (89.5%) cases were found to be normal by Gross Motor Function Classification System (GMFCS). By Bender Gestalt II visual motor and visual perception tests, five (26.3%) cases and nine (47.4%) cases were in the 0-25 percentile for age respectively. The difference in mean IQ level between cases and controls was significant statistically ($p<0.001$). The mean values of Malins verbal and performance tests, IQ, Bender copy and recall tests between cases and controls with the encephalopathy scores showed statistical significance($p<0.05$).

Conclusions: Children who had suffered NE had significant affection of IQ, visual-motor, visual perception and memory in comparison to controls. Greater the encephalopathy score, greater was the cognitive impairment.

Keywords: *Child, Cognition, Critical care, Bender Gestalt test, Visual perception.*

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INTRODUCTION

Neonatal encephalopathy (NE) is a clinical syndrome noted in the early days of life of a term infant characterized with neurological impairment. Clinical manifestations include depression of tone/reflexes,difficulty in initiating and maintaining respiration, subnormal level

of consciousness and seizures.[1] A clinical scoring by Miller and staging by Sarnat and Sarnat are widely used in identifying and grading of NE.[2,3] The incidence of NE is between 2-6 per 1000 term neonates.[4-8] NE is associated with early neonatal mortality and long term neurodevelopmental sequel.[9,10]

The etiology of NE is heterogeneous and neonates with birth asphyxia and hypoxic ischemic encephalopathy (HIE) constitute the majority. The other etiologies would include metabolic causes like hypoglycemia with persistent seizures, inborn errors of metabolism, central nervous system (CNS) malformations and infections. Role of antepartum and intrapartum factors in the pathogenesis of NE have been studied.[6,11] However using magnetic resonance imaging modality in cohorts of NE, it was found that most of the brain injuries usually occurred near or at the time of birth.[12,13]

Functional motor deficits can be detected early during infancy, however cognitive deficits appear slowly and may become obvious during preschool and school period, hence constant follow up is mandatory among the NE survivors. Cognitive development includes the ability to read, talk, learn to write, memorize, calculate, organize, conceptualize, paying attention and social interaction with appropriate behavior. Cognitive dysfunction manifests with scholastic backwardness, poor coordination, behavioral problems, and hyperactivity along with specific learning disabilities. This follow up study was conducted to determine the motor and cognitive functions of term neonates with neonatal encephalopathy, managed in our neonatal unit, at school age.

MATERIALS AND METHOD

A hospital based retrospective cohort study was conducted at the pediatric outpatient services of a tertiary teaching medical college hospital, Mangalore between July 2009 and June 2010. Survivors of term neonates who fulfilled the criteria for NE [1,2] during the first 72 hours of life and managed in the NICU between 2001 and 2003 in the same hospital were taken as cases. Children born as term babies during the same period requiring no intensive care were taken as controls.Neonates with prematurity, major congenital malformations, intra uterine infections, sepsis, pulmonary and cardiovascular disorders resulting in hypoxia were excluded from the study.

After obtaining the approval from the institutional Ethics Committee (IEC), necessary permissions were taken from the hospital authorities. The study subjects were selected using convenient sampling technique. NICU admission/discharge records between 2001 and 2003 were analyzed. Subjects and controls fulfilling the inclusion criteria were requested for a follow up visit at the OPD services of the hospital. Details of antenatal, natal, postnatal data and NICU course were entered in a semi structured pretested proforma. Clinical Scoring and staging of NE were documented.

A onetime follow up at 6 – 8 years of age was carried out to assess the motor and cognitive function. Subject's parents/guardians were approached and explained about the objectives of the study in a language they understood and a participant information letter was provided to them. A written informed consent was obtained from each one of the parent/guardian. A detailed physical examination with specific emphasis on development and neurological evaluation was carried out.

The disability was assessed by GMFCS,a five level classification system designed to detect cerebral palsy.[14] Visual motor and perception functions were assessed by Bender Gestalt II test, which is a psychological assessment tool that evaluates visual maturity , visual motor integration skills and recall phase(for visual memory).[15] Cognitive abilities were assessed by Malin's Intelligence scale for Indian children, which generates a performance IQ, verbal IQ, and a total IQ score.[16] In case of parental concerns on hearing and speech defects appropriate referral was done for a detailed assessment. All the tests that had been used in this study had been validated in the pediatric population.

Analysis was done using Statistical Package for Social Sciences (SPSS Version 11.5, Chicago IL). Correlations of data between the cases and controls and within the risk groups were done by Kruskal Wallis test and Mann Whitney U test. A p value of <0.05 was considered significant.

RESULTS

Of the 40 cases enrolled, 19 cases were included. The baseline characteristics of the study are as in table 1. Table 2 depicts the Millers encephalopathy scoring for the study subjects. Greater than half of the cases (52.6%) had an encephalopathy score of one. Functional and cognitive assessment tests are as in table 3.By GMFCS,

majority had no motor disabilities. As per the Bender Gestalt II tests, visual motor and visual perception was severely affected in five (26.3%) and 9 (47.4%) cases (Table 3).

Malins verbal and performance tests had affected cases more than controls, the difference being significant (Table 4). The mean IQ level between the cases and controls was significant statistically ($p<0.001$).Recall and recopy tests of Bender Gestalt II (table 4) revealed that the memory was more affected in cases than in controls and was found to be statistically significant ($p<0.001$). The mean values of Malins verbal / performance tests, IQ and Bender copy/ recall tests were studied individually with the encephalopathy scores (table 5). The mean values in the above tests with encephalopathy score 1 and 2 were almost equal. The mean values of all the above tests were of higher values in cases with encephalopathy score 4 than with encephalopathy score 3.This difference was probably attributed to the early stimulation by the motivated and determined parents for their children who had encephalopathy score of 4. Among the behavioral problems, in our study, 6(31.6%) cases had temper tantrums. There were no children who had associated ADHD and autism.

Table 1: Basic characteristics of cases (n=19) and controls (n=19)

Variable	**Cases (N=19) n(%)**	**Control (N=19) n(%)**
Age in years 6 7 8	 9(47.4) 6(31.6) 4(21.1)	 3(15.8) 7(36.8) 9(47.4)
Gender Males females	 12(63.2) 7(36.8)	 8(42.1) 11(57.9)
Parity of mothers Primigravida mothers Multigravida mothers	 16(84.2) 3(15.8)	 13(68.4) 6(31.6)
Evidence of developmental delay Present Absent	 5(26.3) 14(73.7)	 0 19(100)

***Cont...* Table 1: Basic characteristics of cases (n=19) and controls (n=19)**

Gross motor function classification system Normal Abnormal	 17(89.5) 2(10.5)	 19(100) 0
HIE stage(Sarnat and Sarnat) Stage 1 Stage 2 Stage 3	 11(57.9) 6(31.6) 2(10.5)	 - - -

Table 2: Encephalopathy score distribution among cases and controls

	Groups	
Encephalopathy score	**Cases (N=19) n(%)**	**Controls (N=19) n(%)**
0	0	19(100%)
1	10(52.6%)	0
2	1(5.3%)	0
3	4(21.1%)	0
4	4(21.1%)	0
5	0	0

Table 3: Functional and cognitive assessment tests among cases and controls

	Groups	
Name of the tests	Cases(N=19) n (%)	**Controls(N=19) n (%)**
Gross motor function classification system Normal Abnormal	 17(89.5) 2(10.5)	 19(100%) 0
Bender motor (percentile for age) 0-25 26-50 51-75 76-100	 5(26.3%) 2(10.5%) 3(15.8%) 9(47.4%)	 0 1(5.3%) 4(21.1%) 14(73.7%)
Bender visual perception (percentile for age) 0-25 26-50 51-75 76-100	 9(47.4) 4(21.1) 2(10.5) 4(21.1)	 4(21.1) 1(5.3) 0 14(73.7)

Table 4: Comparison of cognitive assessment tests among cases (N=19) and controls (N=19)

	Group	Mean ±SD	P value
Malin verbal	Cases	83.93(±22.15)	**p<0.001**
	Controls	121.53(±13.82)	
Malin Performance	Cases	65.44(±28.26)	**p<0.001**
	Controls	113.05(±11.13)	
IQ	Cases	74.65(±22.24)	**p<0.001**
	Controls	117.29(±11.96)	
Bender copy	Cases	67.24(±41.77)	**p<0.001**
	Controls	94.01(±13.39)	
Bender reall	Cases	30.67(±25.43)	**p<0.001**
	Controls	83.43(±20.63)	

*Mann Whitney test

Table 5: Comparison of cognitive assessment tests with encephalopathy scores

Test name	**Encephalopathy score**	**Number of cases**	**Mean values±**	**p value**
Malin verbal	1	10	96.75 (±15.04)	**0.014**
	2	1	102.00	
	3	4	56.88 (±19.41)	
	4	4	74.44 (±11.66)	
Malin performance	1	10	80.70 (±11.09)	**0.02**
	2	1	87.20	
	3	4	39.44(± 28.67)	
	4	4	47.88(± 36.80)	
IQ	1	10	88.66(±10.77)	**0.012**
	2	1	94.6	
	3	4	48.19(±9.45)	
	4	4	61.13(±23.81)	
Bender copy	1	10	89.55(±20.13)	**0.043**
	2	1	99.90	
	3	4	21.83(±31.5)	
	4	4	48.70(±55.11)	
Bender recall	1	10	40.40(±23.3)	**0.022**
	2	1	76.83	
	3	4	8.39(±9.87)	
	4	4	17.07(±14.88)	

*Kruskal-Wallis test

DISCUSSION

The deficits in cognition and motor functional deficits are of great concern among NE survivors. Studies show that neonates with mild NE had no greater increased risk of cognitive deficits or subtle motor impairments.[17-19] However neonates with severe NE had more risk of mental retardation and cerebral palsy.[19-21]

Studies have documented neonates with moderate NE had visual motor/perceptive dysfunction, memory impairments and hyperactivity as cognitive deficits with no functional motor deficits.[17,18,20-22] Most often, there was delayed readiness to school with requirement of appropriate age based interventions at school and was not restricted to mental retardation .

Robertson et al studied HIE neonatal cohorts with age matched controls. Survivors without disability who had moderate NE had a greater risk of delayed readiness to school, lower scores for auditory memory, letter recognition, quantitative language, lower IQ and visual–motor integration (VMI) scores. They were similar to controls as in perceptual motor skills and receptive vocabulary, however there was significant delay in spelling, arithmetic and reading.[19] Similarly other studies showed cognitive dysfunction among moderate to severe NE.[20-22] In our study, IQ levels visual-motor, visual perception and memory were more lower in the cases than the controls with worsening as the encephalopathy scores increased.

Gonzalez et al in his review study documented that despite absence of functional motor deficits, moderate /severe NE survivors had risk of developing cognitive defects especially if Magnetic resonance imaging (MRI) brain showed watershed pattern of injury.[23]

In a review study on neonatal encephalopathy by van Handel M et al, children with mild NE had a near normal outcome while, children with severe NE had severe involvement of educational general intellectual capabilities and neuropsychological outcomes. There was heterogeneity with respect to outcomes in children with moderate NE and most of them had involvement of the domains such as arithmetic/mathematics, spelling and reading.[24]

Among the behavioural problems in children with moderate NE, hyperactivity[19,21,22] and autism with moderate and severe NE[25] have been reported. In our study there was no case of ADHD observed.

NE survivors with abnormal MRI either had impaired neurological functions or minor difficulties in motor and perceptual functions when assessed at 5–6 years of age.[17] In our study MRI was not done in study period mainly due to the feasibility issues. Based on brain injury patterns associated with NE on MRI, cognitive and behavioral issues could arise. Striatum and hippocampus were the most affected areas.[26-28].These areas have been related with cognitive functions corresponding to attention and memory and may attribute to the pathogenesis of autism, ADHD and schizophrenia.[28,29]

The present study has limitations. Good Enough Draw a man test which was initially planned as part of cognition assessment was not done due to subjective reasons most common being losing interest during the course of the administration of various tests. The sample size was small. There was a onetime contact with the subject. Studies on a large scale and using more tests with multiple interactions with subjects would help us to better understand affected areas of cognition and motor function.

CONCLUSIONS

Thus to conclude, there was statistical significant difference in IQ level between the cases and controls ($P<0.001$) .Visual-motor, visual perception ($P<0.001$) and memory was affected in cases compared to controls. Greater the encephalopathy score the IQ, visual motor, visual perception and memory were more affected.

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Evaluation of Differentiation Tests for *Mycobacterium tuberculosis* from *Non tuberculous Mycobacteria* by MPT64 TB Rapid Test and Selective Inhibition with p-nitrobenzoic Acid

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ABSTRACT

Introduction: Rapid differentiation of the *Mycobacterium tuberculosis* complex (MTBC) and Non tuberculosis mycobacteria (NTM) is crucial to facilitate early and effective treatment of the patients. An immunochemistry-based MPT64 antigen detection test (MPT64 test) has reported higher sensitivity in the rapid diagnosis of Mycobacterium tuberculosis and differentiation from non tuberculous mycobacterium compared with conventional methods. **Materials and method:** A total of 927 clinical specimens were processed for tuberculosis. All the samples were decontaminated using NALC-NaOH and re-suspended sediments were inoculated for culture in Bact Alert 3D automation system, and in LJ media with Para nitro benzoic acid(Hi media) at a concentration of 500 µg/ml. **Results:** Of the 927 specimens processed for acid-fast bacilli, 462 were positive on solid and liquid media. 371 of the 462 positive cultures were identified as *Mycobacterium tuberculosis*, 91 isolates were identified as *Nontuberculous mycobacteria* by PRA -hsp65, PRA-16S 23S rRNA ITS. 368 out of 371 positive results for *M.tuberculosis* by MPT64 TB rapid test. Of the 91 *Non tuberculous mycobacteria* 90 had exhibited growth on LJ media with para nitro benzoic acid. **Conclusion:** Proper diagnosis is the first step towards better management and prevention of tuberculosis transmission. The immunochromatographic assay is a simple and rapid test with high specificity in discriminating between *Mycobacterium tuberculosis complex* and *Non tuberculous mycobacteria* in liquid cultures.

Keywords: *Para nitro benzoic acid, MPT64 TB rapid test, Non tuberculosis mycobacteria, Mycobacterium tuberculosis complex.*

INTRODUCTION

Tuberculosis is a highly infectious disease caused by Mycobacterium tuberculosis complex (MTBC) a potentially fatal disease of human and is now recognised as one of the most common opportunistic infection among immunocompromised presenting in the form of pulmonary, extrapulmonary and disseminated opportunistic infections.[1,2]

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Until recently, NTMs were not considered clinically important because they were not found to cause diseases. However, lately, the prevalence of clinical NTMs, especially pulmonary NTMs, has been on the increase worldwide. NTMs are clinically important as they triggers disease and true infection. The signs and symptoms of pulmonary infection due to MTBC or NTM often resemble, and their differentiation through acid fast stain is incomprehensible. There are over 170 species identified to date, and unlike *M. tuberculosis,* NTMs are generally free-living, ubiquitous organisms in the environment. The ecology of NTMs makes it easier for human exposure.[3, 4, 5,6]

Among NTM, rapidly growing mycobacteria (RGM) are those which show visible growth on solid

culture media within seven days.[7] *Mycobacterium tuberculosis* complex (MTBC) and non-tuberculous mycobacteria (NTM) may or may not have same clinical presentations, but the treatment regimens are always different.[1] NTM is easily misdiagnosed as M.tuberculosis and multidrug-resistant(MDR), XDR (Extreme drug resistant) TB and are inappropriately managed with 1st line anti tubercular drugs because of lack of discrimination between MTB and NTMs in small hospital laboratories.[8]

Introduction of the liquid culture automated systems has significantly shortened the cultivation time of mycobacteria.[9] In 2007 WHO recommended liquid TB culture rapid detection and drug susceptibility test as standard method for TB diagnosis and case management, automated culture system like MGIT, BACTEC 460, MB Bact alert 3D automation system have significantly reduced the turnaround time for culture but do not help in differentiating MTB and NTMs.[3] Liquid cultures positive for acid-fast bacilli (AFB) indicate the presence of mycobacteria, requiring discrimination between *Mycobacterium tuberculosis complex* and nontuberculous mycobacteria [10]

Excretory proteins such as MPB64 and MPT63 secreted during bacterial growth have shown potential for differentiating Mycobacterium tuberculous complex and Nontuberculous mycobacteria with high accuracy.[11,12] A new rapid Immunochromatographic test kit(SD Bioline MPT64TB Ag Kit) for detection of MPT 64 Antigen in *M. tuberculosis* isolates using mouse monoclonal MPT 64 Antibody developed by SD Bioline, South Korea and Growth on LJ medium containing Para nitro benzoic acid was evaluated for rapid identification of *M. tuberculosis* isolates.[13]

MATERIALS AND METHOD

The present study was conducted over a period of one year (February 2014- January 2015) in Department of Microbiology, Sri Lakshminarayana Institute of Medical Sciences, Pondicherry to investigate the prevalence of NTM strains. A total of 927 clinical specimens suspected of pulmonary and extra pulmonary tuberculosis were processed. The samples were decontaminated using NALC-NaOH and re-suspended sediments inoculated for culture in Bact Alert 3D automation system, as per the manufacturer's guidelines on routine basis. Simultaneously in LJ media with Para nitro benzoic acid(Hi media) at a concentration of 500 µg/ml., then incubated at 37 °C for a maximum of eight weeks. Growth of *M. tuberculosis* is inhibited by p-Nitrobenzoic acid (PNB), whereas, NTM are resistant.[11]

The test uses monoclonal anti-MPT64 antibodies to detect MTBC in samples from positive MB Bact alert 3D automation system. MPT64 - ICA displays a strong reaction band with organisms belonging to the *M. tuberculosis* complex but not with *Non tuberculosis mycobacteria*.[5]

RESULTS

A total of the 927 specimens processed for acid-fast bacilli, 462 were positive on solid and liquid media concurrently with conventional phenotypic methods like growth on LJ media and Bact alert 3D automation system, molecular methods like PRA-hsp65, RFLP 16S 23S rRNA ITS gene and hsp65 gene sequencing and the MPT64 assay. Of the 462 positive liquid cultures, 371 were identified as *Mycobacterium tuberculosis*, 91 isolates were identified as *Non tuberculous mycobacteria* by PRA -hsp65, RFLP 16S 23S rRNA ITS gene and hsp65 gene sequencing. The sensitivity of MPT64 assay is 99.1%, 368 out of 371 positive results for *M.tuberculosis* in liquid cultures.

Of the 91 *Non tuberculous mycobacteria* 90 had grown on LJ media with para nitro benzoic acid, one strain of NTM doesn't exhibited growth, it was identified as *M. simiae* by hsp 65 gene sequencing. *(Table: 1)*

Table - 1: Sensitivity pattern of SD Bioline MPT 64 Ag rapid test and selective growth inhibition of M.tuberculosis by para-nitrobenzoic acid in LJ medium.

Test method	Result	MTBC	NTM
SD Bioline MPT 64 Rapid test	Positive	368	0
	Negative	3	91
	Total	**371**	**91**
Growth on LJ medium with PNBA	Positive	0	90
	Negative	371	1
	Total	**371**	**91**

DISCUSSION

To identify mycobacteria, conventional biochemical tests are traditionally used. Key tests can be used to identify species, or further preliminary grouping may be used. Other approaches to identifying some species of mycobacteria are available. They include the *p*-nitrobenzoic acid and *p*-nitro-α-acetylamino-β-hydroxypropiophenone tests for discrimination of the *M. tuberculosis* complex from mycobacteria other than *M. tuberculosis.*[13]

The study was undertaken to evaluate the performance of the SD Bioline TB Ag MPT64 assay, some tuberculosis culture laboratories still rely on para-nitrobenzoic acid (PNB), a traditional technique that requires sub-culturing of clinical isolates and two to three weeks to give results. Rapid identification tests have improved turnaround times for mycobacterial culture results. Considering the challenges of the PNB method, we assessed the performance of the SD Bioline TB Ag MPT64 assay by using PNB as gold standard to detect *M. tuberculosis* complex from acid-fast bacilli (AFB) positive cultures.

In our study we reported 99.1% sensitivity with SD Bioline immunochromatography kit, many researchers from India had evaluated SD Bioline kit similar findings were seen with Maurya et al from Lucknow reported 99.1% sensitivity. Kannade et al from Mumbai had reported and observed sensitivity of 99.19%, in contrast a study from Mysore by Vijay G.S Kumar reported 100% sensitivity. [14, 15, 16]

We reported three false negative findings because of small MPT64 antigen quantity, due to a small AFB count so it is recommended to perform repeated testing after further incubation with AFB-positive.

In our study, we reported 98.9% accuracy with PNB in LJ media almost similar results were reported by Sharma.B *et al.,* from Jaipur, a study from Delhi by Varma – Basil.M *et al.,* and a study by Nepali.S *et al.,* from Nepal reported 100% sensitivity with PNB on LJ media. [11, 17, 18]

CONCLUSION

Proper diagnosis is the first step towards better management and prevention of tuberculosis transmission. Conventional identification methods are laborious, cumbersome and time-consuming, while molecular identification methods are expensive and require skilled technical personnel and established molecular laboratory infrastructure. Immunochromatographic assays (ICAs) is found to be rapid, reliable and low cost for diagnosis and differentiation of M.tuberculosis complex from Non tuberculous mycobacteria.

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Effect of Flexibility with Resisted Exercise on Foot Vibration Perception Threshold in Diabetic Neuropathy in Type II Diabetus : A Pilot Study

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ABSTRACT

Objective: Diabetes have mild to moderate nervous system damage which includes impaired sensation, pain in the feet, hands and other nerve problems. Diabetic peripheral neuropathy(DPN) is the common complication of diabetes in which symptoms are affecting lower extremities such as pain, paraesthesia, loss of vibratory sensation threshold, muscle weakness, balance instability. The present study aimed to evaluate the effect of 8-week of flexibility with resisted exercises on foot vibration perception threshold in type 2 diabetic neuropathy patients.

Materials and Method: A pilot study was carried out in a tertiary setting. There were 15 participants with type 2 diabetes who were eligible for the study as they had clinical neuropathy which was defined by mild and moderate form based on the modified toronto clinical neuropathy score. Following which, biothesiometer was used to measure the foot vibration threshold and the patients were assigned to a 8 -week pre and post test program. A paired t test was used for data analysis.

Results: After the 8-week flexibility with resisted exercise on diabetic peripheral neuropathy patients there was a significant difference in pre-post intervention in scores with a mean difference of) 0.53±0.13 mV of vibration threshold

Conclusion: A Flexibility exercise program with resisted exercise showing a reduction in vibration perception threshold in peripheral neuropathy in type 2 diabetes

Keywords*: Flexibility exercises, Resisted exercises, Biothesiometer, Diabetic neuropathy, Modified Toronto clinical neuropathy scale.*

INTRODUCTION

Diabetes have mild to moderate nervous system damage which includes impaired sensation, pain in the feet, hands and other nerve problems and they are biochemical and vascular factors leads to high blood glucose, ischemia and affecting nerve fibre mechanism. They are variety of neuropathy in that most common one is symmetric polyneuropathy, in which symptoms are affecting lower extremities such as pain, paraesthesia, loss of vibratory sensation, muscle weakness, balance instability. General measures are glycaemic control, drug management, foot care, exercises.

Diabetic Peripheral neuropathy(DPN) starts in the toes and gradually moves proximally. Once it is well established in the LE, it affects the upper limbs with sensory loss following a typical 'Glove and Stocking' pattern of distribution[1]. Nerve conduction tests are the objective indication of the condition which shows the abnormality [2].

The coordination and integration of sympathetic nervous system is extremely important in the maintenance of blood glucose at rest and exercise. Strong evidences support that intensity and duration of exercises are very important in determining the fuel usage during exercise [3]. With prolonged exercise duration, glucose would be

used as primary fuel source and the production of glucose shifts from glycogenolysis to gluconeogenesis[4]. Use of the vibration perception threshold (VPT) is a simple way of detecting large-fiber dysfunction, thus identifying individuals with diabetes at risk of ulceration[5].

Hence the present study aimed to evaluate the effect of 8-week of flexibility exercise program along with resisted exercises on foot vibration perceptionthreshold in type 2 diabetic neuropathy patients.

METHOD

An observational pilot study was carried out in a tertiary setting. People with type 2 diabetes were eligible for the study if they had clinical neuropathy which was defined by Modified Toronto clinical neuropathy score. The exclusion criteria included the following: an inability to walk independently of assistance, presence of any lower-limb amputation, significant foot deformity (e.g., Charcot), open foot ulcers, history of cerebral injury and poor visual acuity, severe cardio pulmonary involvement.

Tool

Biothesiometer: This is the measure of vibration sensation indicating the condition of the nerves in diabetes, a value of more than 25 volts indicates the presence of significant neuropathy. As a procedure a probe is applied to the part of the foot on big toe and the probe could be made to vibrate at increased intensity by turning a dial. When tested indicates as soon as participants can feel the vibration and the reading on the dial at the point is recorded. The biothesiometer can have a reading from 0-50 volts.

Exercise Protocol

Flexibility exercises: General flexibility exercise involving all major muscle groups for 15 minutes duration.(Upper limb, Lower limb, Trunk) 2 to 4 repetitions, static stretching holding 15 seconds described by AHA statement, Mark A. Williams [6].

Resisted exercises involving major muscle group for 10 repetitions, 2 sets, mild intensity, described by Ronald J sigal MD MPH et.al [7]

Statistical Analyses

All statistical analyses were performed using the SPSS software version 20 with 95% confidence interval and p value significance kept less than 0.05. Descriptive statistics and paired t test was used for pre –post comparisons.

RESULTS

The present study included 15 DPN subjects with the mean age of 56.28±4.18.The descriptive statistics of the subjects are given in Table 1.

Table 1: Descriptive statistics of Participants

Characteristics	Group [N=15] Mean ± SD
Age (years)	56.28±4.18
Height (cm)	161.18±4.93
Weight (kg)	65.45±7.12
BMI	25.78± 0.52
HbA_1c	7.43 ±0.66

A paired sample t test showed that there was significant difference between the point of measurements (pre and post intervention) for foot vibration threshold (Table 2 & figure1).

Table 2: Paired t test result for foot vibration threshold

Mean difference	Standard error	t value	P value
0.53	0.133	4.0000	<0.05

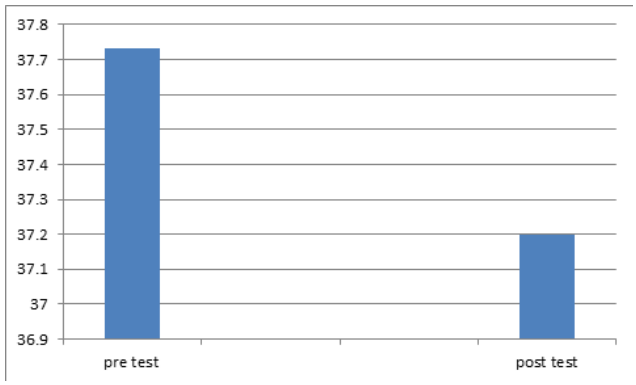

Figure 1: Foot vibration threshold (pre and post exercises intervention)

DISCUSSION

The present study used 15 DPN subjects and aimed to evaluate the effect of 8-week Flexibility with resisted exercises on foot vibration threshold. The result showed

the statistically significant reduction in foot vibration threshold after the interventional exercise programme. The pre- test mean was 37.73, post- test mean was 37.20 and mean difference was 0.53, which showed that there was reduction of VPT in the biothesiometer in response to exercises intervention. The result of the present study is also in line with the results of other studies in DPN subjects which used biothesiometer to assess the vibration perception threshold.

Similarly, In a study the percentage of diabetic patients who developed increased VPT (25 V) was significantly higher in the control than the exercise group (21.3% vs. 12.9%, $P<.05$).[8] The diagnosis of diabetic neuropathy by biothesiometer has been reliable and Vibration perception threshold (VPT) is considered as a gold standard for diagnosis of diabetic peripheral neuropathy[9,10]. In the non diabetic control subjects, height demonstrated the best correlation with VPT measures, and a reference range was thus established with percentile charts, using mean VPT and height. VPTs were higher in the diabetic sample, compared with the non diabetic sample ($P< 0.05$)[11]. The insulin mediated blood glucose transport is predominant at rest and while exercising muscle contractions remain as the major factor for transport of blood glucose as a fuel source into the muscle. Glucose transporter 4(GLUT 4) a type of protein is the main factor in transporting glucose into the muscles with insulin as well as contractions by muscles during exercise [12]. A randomized controlled trial on the effect of blood glucose in T2DM reported of 46% increase in insulin action after 16-week programme of resistance exercises[13]. A total of 100 patients, 21 patients had normal (15 volts) value, 35 had grade I (16-25volts) and 44 had grade II (>25 volts) on the biothesiometer machine[14].

The mean VPT in the non-diabetic group was 14.4 whereas in the diabetic group it was

16.19. There was statistically significant difference between the non-diabetic group and diabetic group ($p<0.05$)[15].

CONCLUSION

Flexibility exercise program with resisted exercises showed a reduction of foot vibration threshold in diabetic type 2 Peripheral neuropathy.

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Conflict of Interst: No conflict of interest as authors concerned.

Ethical Considerations: The study was initiated after getting the approval from the Institutional Human Ethics Committee of Saveetha University, Chennai. The whole procedure of the study was very well explained to the participants by providing them with information sheet. Their doubts were cleared and the informed consent was obtained. Translation of the information sheet and the informed consent to the local language was done. Confidentiality of the data was ensured.

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Bone Grafts in Periodontal Regeneration

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ABSTRACT

The most serious consequence of Periodontal disease is the loss of the periodontal supporting structures, which includes the periodontal ligament, alveolar bone and cementum resulting in the early loss of teeth. Bone replacement grafts are widely used to pro- mote new bone formation and periodontal regeneration in periodontal therapy especially in intrabony defects. Bone grafts are used as a filler and scaffold to facilitate bone formation and promote wound healing. These grafts are bioresorbable and have no antigen-antibody reaction. These bone grafts act as a mineral reservoir which induces new bone formation. In this original research, bone grafting was done to replace the lost bone due to periodontal defects and the results are shown in the photographs attached. The various periodontal parameters were also recorded for the purpose of evaluating the success of bone grafts.

Keywords: *Bone graft, regeneration, periodontal index, regenerative therapy, periodontitis.*

INTRODUCTION

The goal of periodontal therapy remains to provide a dentition that functions in health and comfort for the life of the patient. Periodontal therapy involves two primary components. First, elimination of the periodontal infection, by eliminating the pathogenic periodontal microflora, which induces substantial favorable clinical changes in the periodontium. However, the anatomic defect resulting from active periodontitis still persists and is represented clinically by loss of clinical attachment, increased probing depths and radiographic bone loss. The substantial efforts made to alter this defect represent the second component of periodontal therapy. The primary approaches to correcting these defects include new attachment, resective and regenerative procedures[1].

Regenerative treatment has as its goal elimination of periodontal defects by regenerating the lost periodontium including bone, cementum and periodontal ligament[2].

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Advances in the understanding of periodontal regeneration provide a basis for applying the fruits of molecular biology to periodontal treatment. Thus, factors that stimulate formation of bone, ligament and cementum can potentially be used to augment the normal healing process and stimulate periodontal regeneration[3].

Alloplastic materials used recently to reconstruct osseous periodontal defects include ceramics, collagen and polymers. Although several therapeutic approaches have been investigated, current scientific interest in alloplastic replacements is focused on HTR polymer[4].

MATERIALS AND METHOD

Five patients were selected from those attending the Dental College Hospital as out – patient for the treatment of chronic Adult Periodontitis. They were 3 male and 2 females of the age group of 25 to 45 years. Prior to their admission to the study a detailed medical history was taken from each patient to ascertain that they had no systemic disease that might influence their periodontal condition or contraindicate periodontal surgery. Other exclusion criteria were allergies, pregnancy. No patients wearing prosthesis, orthodontic appliance, or endodontically treated teeth was admitted into the study, for admission to the study each patient was required to have at least two periodontal angular osseous defects.

INITIAL THERAPY

All patients completed a course of treatment involving root planning and plaque control. The duration of this preparatory phase varied depending upon the response of the patient to the plaque control program. All patients maintained an excellent standard of oral hygiene with consistently low levels of plaque, during last few assessment preceding surgery. Informed consent was obtained from all patients admitted to the study in addition to an agreement to attend regular follow up visits.

EXPERIMENTAL PARAMETERS

Before surgery the following indices were measured in a sequential manner from the involved teeth as follows.

Plaque index source – (Silness and Loe – 1964)

Mobility index score – (Millers mobility index 1950).

Gingival index score – (Loe and Silness – 1963)

Sulcus bleeding index score – (Muhlemann and Mazor – 1958)

A customized acrylic occlusal stent was prepared on the study cast for each patients. A No 559 fissure bur was used to groove the stent in an occluso – appical direction at a point were the graft materials has to be placed. The groove provided reproducible alignment of a endodontic silver point. The base of the stent served as a reference point to take the soft tissue measurements.

The following soft tissue measurements could be recorded with the help of the acrylic occlusal stent and endodontic silver point.

Height of the gingival margin – HGM (stent to coronal extent of the gingival margin).

Probing clinical attachments level – PCAL (stent to base of periodontal pocket).

Probing pocket depth – PPD (gingival margin to base or periodontal pocket)

PRE SURGICAL PROCEDURE

Intra - oral periapical radiographs of each defect were exposed by Bisecting Angle technique.

SURGICAL PROCEDURE

Preoperative pictures and radiographs are taken initially.(Figure1 and Figure 5)The patients were made to sit comfortably on a dental chair. Under local Anesthesia [lignocaine with adrenaline 1:8000] a crevicular incision was made from the base of the pocket to the crest of the bone using Bard parker knife and blade number 15.

A full thickness mucoperiosteal flap was raised using a periosteal elevator. The granulation tissues were removed from the defects and root planing was done. The area was then irrigated with saline.

The following hard tissue measurements were recorded using the customized acrylic stent and the endodontic silver point.

Crestal height of alveolar bone – CHAB (stent alveolar crest) (Figure 2)

Bone loss (stent to base of osseous defect)

Depth of the Defect – DD (Alveolar crest to the base of the osscous defect)

The graft materials were mixed with a drop of sterile saline to get putty like consistency. It was then packed into the defect upto the most coronal level of the surrounding bony wall(Figure 3). The flaps were sutured using vertical mattress method of suturing (with the help of polyvicryl 5-0 resorbable sutures) (Figure 4). This formed the test site.Immediate post operative radiograph was taken.(Figure 6).

The other defect forming control site was debrided of granulation tissue and left ungrafted. The flaps were sutured using interrupted (polyvicryl 5-0 resorbable suture).

A periodontal pack was given after the surgical procedures in both the test and control sites respectively.

POST SURGICAL FOLLOW UP

The dressing was removed one week after surgery and the surgical site was thoroughly irrigated with saline. Patient was asked to continue with chlorhexidine mouth rinse 0.12% for another one week. Recall appointments were made after 2 weeks, 1st month, 3rd month and 6th month respectively. At each visit scaling was done and

oral hygiene instructions were given.

At the end of the 6th month each site was reassessed of all clinical soft tissue parameters. The soft tissue and hard tissue measurements were made with the same acrylic stent which was fabricated six months earlier to avoid calculation errors.

Radiographs were taken and it was compared to the radiographs taken six months earlier prior to compare the changes in the bone morphology.

CLINICAL PHOTOGRAPHS

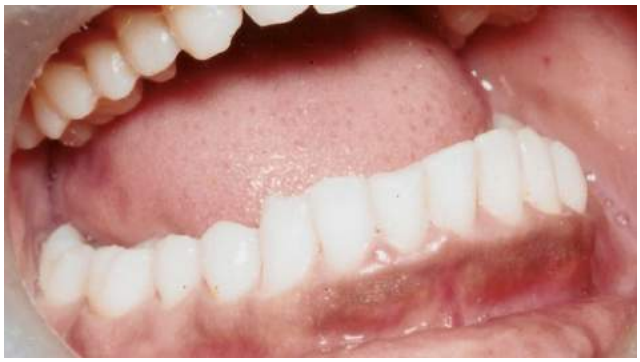

Fig: 1 Pre operative view of the site

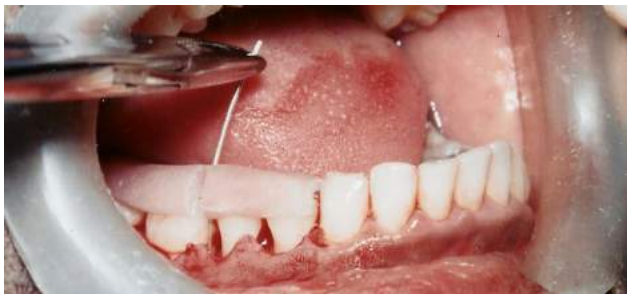

Fig: 2 Soft tissue assessment

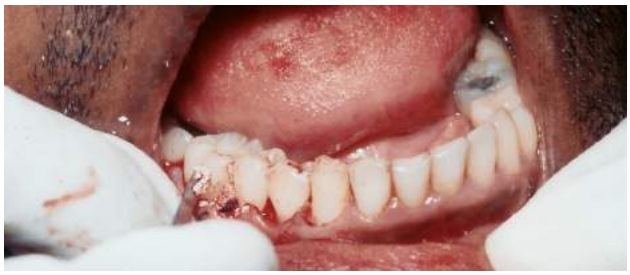

Fig 3 Placement of graft

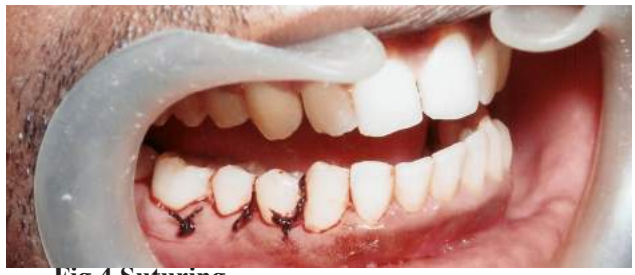

Fig 4 Suturing

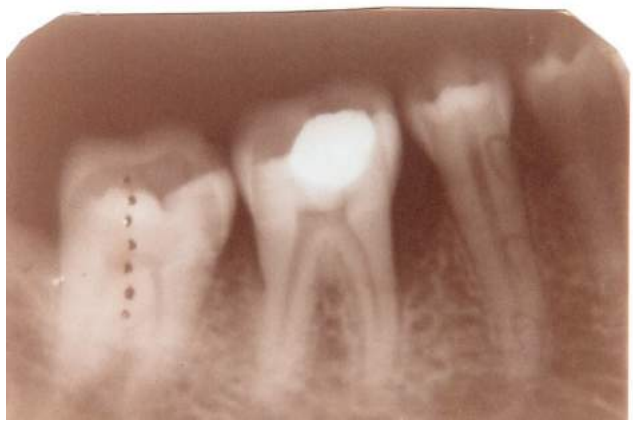

Fig: 5 Pre operative radiograph

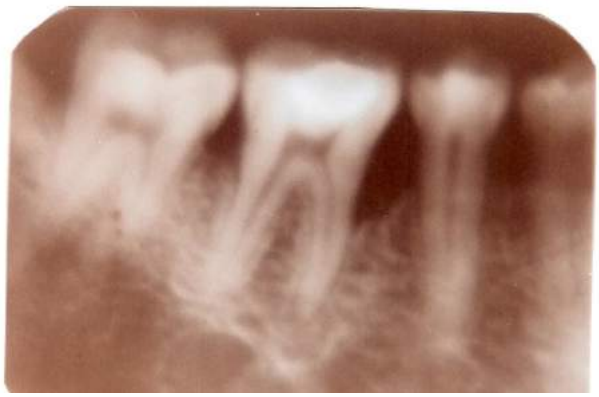

Fig: 6 Post operative radiograph

DISCUSSION

The regeneration of the Periodontium destroyed by inflammatory periodontal diseases has been an elusive goal sought by all who treat periodontal problems. Biomaterials suitable for the suitable for the restoration of periodontal osseous defects continue to be a subject of particular interest and challenge[6]; materials ranging from bone grafts to alloplastic implants have been used with varying degree of success[7].

A total of 10 osseous defects in 5 patients were assessed to evaluate the efficacy of the bone graft material in the management of periodontal osseous defect. The patients were assigned randomly to bone

grafting and conventionally debrided control group.

In light of the above, the present study sought to comparatively assess the efficacy of bone graft in regenerating periodontal bone loss in contrast to conventional open flap debridement procedures.

The test and control group documented a statistically reduction in probing pocket depth with the test group out performing the control group.

Probing clinical attachment levels in both the test and control showed a significant reduction, when compared test group showed a greater significance.

None of the groups showed a significant decrease in the height of the alveolar crest, although marginal decrease did occur in the control groups, which when compared, did not yield a significance.

The test group showed a significant bone again when compared to the control group.

CONCLUSION

Several factors such as case selection, treatment objects and clinical application play an influential role and a longitudinal study with a larger patient sample may yield better conclusions[8]. With active investigations directed toward understanding the biology of the healing site, including identifying appropriate cells to target, coupled with designing delivery systems that can control release of agents at the local site, establishing the required environment for regeneration of periodontal tissues should be feasible[9,10].

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Improvement Efforts of Hazardous Waste Management Implementation in Karimun Regency Fabrication Yard, Indonesia

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ABSTRACT

In its activities, a Fabrication Yard can produce up to. 400,000 kg of waste within 90 days despite implementing maintained procedure on hazardous waste management, which based on the government regulation. The objective of this study is to analyze the improvement efforts of hazardous waste management implemented in the Fabrication Yard..This study uses primary and secondary data with qualitative approach seen from the characteristics of the hazardous and toxic waste produced as well as the implementation of their overall hazardous waste management system. The study design is descriptive and data analysis using the data triangulation. The hazardous waste generated came from 12 facilities out of 17 facilities with 18 different types of waste. The amount of waste generated is influenced by the type of activity and types of materials used in the yard. While management efforts undertaken in the form of waste minimization, waste collection, waste storage, and waste transportation, on which the process of collection, storage and transportation of the hazardous and toxic waste are partially align with the requirements from government regulations. Although aligned, there are rooms to improve the hazardous waste management like implementing strict rules on working on waste segregation and provide necessary training to personnel involved regarding hazardous waste management.

Keywords: *hazardous waste, toxic waste, waste management, fabrication yard.*

INTRODUCTION

Indicators of a construction project are often only associated with economic aspects, quality, quality, and time.(1) The construction industry in developing countries such as Indonesia has not been enough to give a deep concern for the links between the construction project and the environmental aspects. Whereas in its activities, also produce waste that can affect the environment.

Waste is classified as hazardous and toxic waste and non-hazardous waste, judging from their characters such as flammable, corrosive, or toxic. General hazardous waste generated at construction sites include asbestos, lead (as contained in the paint), mercury, solvents / thinners, fuels, oils / lubricants, compressed gas cylinders, until the aerosol cans.(2) A good hazardous waste management can be done to avoid the hazardous characteristic to risk the environment. Waste management can be implemented by enacting government regulation to the applicable national or international standards.

A Fabrication Yard in the Karimun Regency produces offshore construction, jacket and platform, topsides for the FPSO, sub-sea components with a total production up to 65,000 tons / year. The total number of production per year affects the amount of waste generated by the activities held in the yard. According to the documentation, Fabrication Yard can produce waste up to 400 tons within 90 days, for that the Fabrication Yard tried numerous efforts on their hazardous waste management to reduce the number of waste it generates. Based on these circumstances, the objective of this study is to analyze the improvement efforts of hazardous waste management implemented.

METHOD

For the verification of the objectives proposed by this work, an exploratory qualitative research will be made using through primary data and secondary data. All in order to substantiate and justify the formulation of an in-depth interview and participant observation in the primary data collection process, while the secondary data obtained through the literature review of public policies, national waste policy and Fabrication Yard's documentation. The qualitative approach will also analyze the characteristics of hazardous waste produced in the yard (the source, the type and the number of waste generated), and the implementation of each hazardous waste management phase.

Observation will collect data from the object of research, in this case, the steps of hazardous waste management implemented, while in-depth interview will involve informants consisted of the management (HSE Department) and the user (Supervisor / superintendent or person in charge of each facility generating hazardous waste). To be more accurate, the informant was chosen with purposive sampling, with the consideration that the selected informant is someone who directly involved with the research focus.

Another way to test the validity of this study is by triangulation. The triangulation performed in this study includes triangulation of sources, which conducted by cross-checking data and facts from informants to get reliable answers related to the research topics, and triangulation of methods which comparing each data with several methods, namely in-depth interviews, direct observations and literature reviews.

RESULTS AND DISCUSSION

The Fabrication Yard is located in the western part of Karimun Regency, Karimunbesar Island. Karimun Regency was chosen to be a good place for yard based on the consideration of its strategic location, Batam Island in the East and Singapore in the North. Based on Government Regulation No. 48 of 2007, Karimun Regency was also announced as the Free Ports Zone and Free Trade Zone (FTZ) that allows Fabrication Yard to have the exemption of import duties for certain goods and the availability of large ports with the adequate fleet to supply the required materials in Fabrication Yard.

With a total area approximately 1,390,000 m^2, the Fabrication Yard is equipped with numerous facilities divided into two major areas: Non Industrial and Industrial. The hazardous waste generated inside the Industrial area came from 12 facilities out of 17 facilities namely Water Treatment Area, Power Plant Area, Gas Storage Area, General Warehouse, Project Store, Piping Workshop, Prefabrication Workshop, Painting/Blasting Area, NDT Bunker, Maintenance Workshop Area, Assembly Hall and Erection Area.

Based on observations and literature reviews, there are 18 types of Hazardous Waste produced in the yard according to Appendix 1 of Government Regulation No. 101 of 2014 regarding Hazardous Waste Management, where 12 types of hazardous waste derived from Specific Source and other 6 types comes from Specific Sources. According to the Yard's data, Maintenance Workshop and Painting/Blasting Area are facilities with the most hazardous waste produced. On the other hand, the most common type of hazardous waste formed is the used container of hazardous material since its produced by most facilities in Fabrication Yard.

The HSE Department who responsible for waste handling classify the 18 types of waste into group, which based on the calculation conducted by the Department, the Paint, Varnishes and Solvents waste is the highest waste generated with ± 94,467 kg in 90 days, while Light Tubes / Mercury Lamps waste is the lowest waste generated with only ± 234 kg in 90 days, and it is known that the average generation of Hazardous Waste as many as ± 207.396 kg / 90 days.

The amount of waste generation is an indication of how well the implementation of waste management has been applied to measure the quantity of waste generation interval.[3] However, the Yard Environmental Coordinator stated that waste generation numbers are affected by the type of activities carried out in the field, as well as the type of material used so that waste generation numbers are not always stable therefore the amount of waste generated in this case cannot be used as an indication of how well the implementation because of the amount of waste is influenced by several factors.

Several ways can be done in waste minimization phase. Waste minimization activities undertaken in the yard are waste segregation at the source, housekeeping practices, material substitution, environmental friendly technologies, and reuse. The observation found that

although there were four different containers for every waste category was provided in the yard, workers were still mixing the waste. This action was acknowledged by the Structural Supervisor that supervise the Erection Area, he admitted that workers sometimes too lazy to segregate the waste by their types and just threw into the closest containers without considering the characteristics of the waste.

The correct segregation procedure can ensure the waste will be treated according to their hazardous characteristics. Neglecting waste segregation can be dangerous if incompatible hazardous waste characters were mixed, such as the flammable to the toxic and/or corrosive. To segregate, the Fabrication Yard provides helper in the Hazardous Waste Storage to separate the hazardous waste according to their characteristics. In the similar study, it is stated that inspections in the field on a regular basis and review the performance of the waste management in this case waste segregation regularly is required to identify ways to minimize wastes.[4]

Good housekeeping practice has been implemented in all industrial facilities. This fact was supported by the daily briefing by the person in charge to the personnel, where the person in charge repeatedly reminds the personnel to prioritize good housekeeping by the principle of preventive maintenance. The personnel would have to regularly check the state of the materials and tools used, spill kits and Material Safety Data Sheets (MSDS) to prevent any risk. This shows good communication in between supervisors and personnel, and good communication is beneficial to later explain the policies of the hazardous waste management at the corporate level and the field level.[5]

Substitution is done through the replacement of raw materials or auxiliary materials originally containing B3 into raw materials that are more environmentally friendly. [6,7] Material substitution in Fabrication Yard is done before each project begins the fabrication process. Engineers will have to consider the harmful substances in each material before purchasing. However, according to HSE Systems Personnel, to substitute materials need big considerations since the Fabrication Yard mainly works under Client's request, and so to substitute materials needs Client's approval.

The use of environmental friendly technology is the most effective method in minimizing the amount of waste generation at source.[7] Environmental friendly technologies found on two facilities; Painting/Blasting Area and NDT Bunker. Painting/Blasting Area use the technology called Grit Recovery Systems to help them keep the steel grit and steel shot clean to then reusing them in the blasting process. The following figure 2 shows the Grit Recovery Systems technology.

Fig. 1: Grit Recovery System

Another environmental friendly technology used in the yard is the computed radiography for NDT activities. The computed radiography used digital technology so that the liquid fixer and developer are no longer generated. Computed radiography is highly compatible with most conventional x-ray systems are widely used. [8] The use of computed radiography can save costs and other purposes because it does not require the film, hazardous chemicals, dark room, and storage space.

Waste reduction and reuse is the most effective way to conserve natural resources, protect the environment and save money on waste management.[9] Reuse carried out at three facilities, namely Painting / Blasting to reuse the steel grit and steel shot with the help of Grit Recovery System, General Warehouse use their inventory control to offer goods that have been unused to be used again by other vessels / yard in need, and Project Store that maximize the use of waste material from previous projects. Similar study suggests control of inventory is one way to control waste and minimize waste generation at the source.[10]

Hazardous Waste Storage is a facility dedicated to storing all the hazardous waste produced in yard temporarily before being transported for further treatment. In storing the hazardous waste, Fabrication Yard has not yet considered the characteristics of the waste as they store everything in the same place without separation. This was not aligned with the Ministry of Environment and Forestry Regulation No. 30 of 2009 that requires

a dividing line for each type and characteristics of the waste stored, yet seen from the location and supporting equipment available in the Hazardous Waste Storage has complied with the same regulation.

Based on waste records, the yard has been producing for more than 50 kg of waste accumulatively in one day. According to the Government Regulation No. 101 of 2014, waste generated more than 50 kg a day has the storage time limit a maximum of 90 days. However, the duration of waste stored in the Hazardous Waste Storage not be known from observation, interviews, and review of the document since there were no records found on the date the waste being stored and being transported out.

Construction for the container that holds the waste in the waste collection process is aligned with the requirements established referring to Government Regulation No. 101 2014 and the documents as saying that a container to hold hazardous waste must be made of a material that can store the hazardous waste according to its characteristics, is able to accommodate hazardous waste to remain in packaging, has a strong seal to prevent spills, and are in good condition, no leaks, no rust or damaged. Correct symbols and label of hazardous waste must also be attached in the hazardous waste container as stated in the Ministry of Environment Regulation No. 14 of 2013 regarding Symbols and Labels of Hazardous Waste. The labels must at least contain the name of the producer, waste classification, date of production, waste volume and waste destinations, while in the yard label attached was only contains the category of waste such as Hazardous Waste, Organic Waste, and Non Organic Waste.

Based on Government Regulation No. 101 2014, to transport hazardous waste must be done by using the enclosed conveyance for the category 1, and can be performed using the enclosed or open conveyance category 2. This refers to the characteristics of category 1 hazardous waste that is acute, reactive, and can be harmful to the environment in a short amount of time. The conveyances used to transport the waste from each facility to the Hazardous Waste Storage is a pick-up truck, the same truck is also used to transport category 1 waste which should have been transported using enclosed conveyance. To transport the waste from Hazardous Waste Storage to further treatment outside the Fabrication yard is also using the open conveyance although covered by a tarpaulin.

Subsequently, to the activity of Hazardous Waste Utilization, Processing and Hazardous Waste Landfill are not done by Fabrication Yard, but performed by Subcontractors who have cooperated with Fabrication Yard.

CONCLUSIONS

The study has described that there are 18 different types of waste produced in the Fabrication Yard, with different characteristics that need to be considered for each phase of the hazardous waste management. It also shows that the number of waste generated each time cannot represent to indicate how well the implementation of hazardous waste management. The study also found that each phase of hazardous waste management in Fabrication Yard partially aligned with the local regulation oversees them. Although aligned, there are rooms to improve the hazardous waste management like implementing strict rules on working on waste segregation and provide necessary training to personnel involved regarding waste management. Provide good records of the waste storage and treat the waste according to their characteristics will also help the sustainability of hazardous waste management.

Conflict of Interest Statement: The authors of this research declare that there is no conflict of interest related to this study

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Ethical Clearance: The ethical clearance of this research taken from Ethics Committee of Faculty of Public Health, Universitas Indonesia,

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Distribution and Seasonal Variations of Copepoda in Euphrates River at Samawah City, Iraq

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ABSTRACT

The aim of the current study is to investigate the physicochemical parameters of three stations S1, S2, S3 that were selected on the Euphrates River at Samawa City, south Iraq. In addition, the density, distribution, and biodiversity of Copepods were investigated from March 2017 to February 2018. The recorded temperatures of the water were between 11.5- 30 ^{o}C. The densities of Copepods species were 1425 indv /m^3. 841 indv / m^3 and 1081 indv /m^3 in stations S1, S2 and S3 respectively. And the highest density was recorded in S1, S3 during spring and autumn 2017.

The present study demonstrated that only *Macrocyclops sp*., and *Halicyclops sp*. were noticed at station S1, while mesocyclops leucarti., and Lernaea sp. were observed in S1 and S3. The most common genera were Cylops, three taxonomic units. C*yclops Scutifers* and *Cyclops Scutifers* were noticed in all the study stations. *Eucyclops*, *Paracyclops* and Copepoda Naupli were observed in all station and the most common species in stations S1 and S3 were *Diaptomus Franciscanus* during. In contrast, only *E. macrurus* appeared only two times in the S3 station during this study. The current data found that the similarity between the three stations was 70%. And the lowest value of the qualitative deficit was 25% between stationS1 and station S3. Suggesting that both station S1andS2 environment is suitable for the availability of more species than stations S2. Also, this study noticed that the highest diversity of Copepods was recorded at the station n S1 in November 2017. While low Biodiversity was seen at all stations.

Keyword*: Copepods, Zoo Plankton, Invertebrate, Euphrates River.*

INTRODUCTION

Copepods are considering as a source of food for small fish in the rivers around the worlds. However, it could be intermediate hosts for several fish parasites as well as a vector for human infectious disease[1]. Copepods belong to the Cyclopoida order and this creature and their nauplii are crucial and valuable food items in aquaculture[2]. This multicellular animal grows abundantly in the bottom of the oceans and lakes, subterranean water, temporary ponds, small water bodies and even on the water surface of bromeliad leaf [3]. Identify of the zooplankton populations and its location distribution deliver an important information for the study of water bodies, and gives a deep knowledge of this atmosphere, as results allowing to provide of management programs and adequate monitoring[4]. A study has shown that seasonal variation plays an important role in zooplankton distribution, for example, it was the maximum in the summer following an ed by winter and it was the minimum at the Monsoon [5].

It has been reported that approximately 29 species of calanoid, cyclopoid and harpacticoid copepods are found in the water of NW Arabian Gulf Khor Abdulla and Khor Al-Zubair [6-9]. Another local study collected a copepod from the lower Zab and Tigris River has been shown that *Halicycloes sp*., *Paracyclops fimbristus,* and *Nitoscr sp*are the most dominated species [10]. A study was aimed to investigate the Distribution and abundance of zooplankton in Shatt Al-Basrah and Khor Al-Zubair Channels, Basrah, IRAQ, showed that the

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Crustacea was the dominated group 62.9 %. Copepoda constituted about 44.7 % [11]. A study has been detected a six species of Copepoda in Diyala river and the species were *Diaptomus Reighard, Mesocyclops laukartu*, *C. dimorphus, Paracyclops affinis, C. vicious* and *Cyclops vernalis* [12]. Due to insufficient data about the effects of water quality on the biodiversity of Copepoda in the Euphrates River at Samawa City. Therefore, this study aimed to identify: firstly, the monthly changes in physicochemical factors. This means studying both diversity and similarity of Copepoda in the Euphrates River at Samawa City. Secondly, the correlation of physicochemical Characteristics and how its effects on the abundance and biodiversity of Copepoda. Suggesting that the data of this study could be a database of an environmental condition for Copepoda lifecycle in Iraq.

MATERIALS AND METHOD

Description of Study Area

Three stations were selected S1, S2, and S3 which are located on the Euphrates River at Samawa City. Samawa is a town located about 270 km south of Baghdad, capital of Iraq.

Sampling collections

Water samples were collected monthly from the three study stations S1, S2, andS3 of Euphrates River at Samawa City, from March 2017 to February 2018. A forty liters of water were collected from banks and sides of each station on the same river. The concentrated samples were identified using a light microscope, And the resulting individual / m^3 (indv / m^3).[13-15]. Collection procedure that was used in this study depending on a procedure that described by [16]. Water samples were transferred to further analysis in the laboratory were reported by [17]. Water temperature, pH ,The Dissolved oxygen (D.O), and Biochemical Oxygen Demand (BOD_5) were measured using modification Winkler-Azide [18]. Total organic carbon in sediments was measured as described by [19]. In the terms of electrical conductivity values mill Siemens /cm (mS /cm) of water, the salinity values (‰) were calculated according to [20] .

Statistical analysis:

Pearson correlation coefficient (r) was used to correlate physicochemical parameters and density of Copepods by using SPSS 14.0 software at 5% to compare the means of physiochemical parameters measured and used to test the significance of differences.

Sorensen Similarity [20] was used to determine the similarity in stations taxa composition . S = 2J/ (a + b) * 100, where J=number of common species occurred in both station. A= number of species in (a) station. B= number of species in (b) station.

RESULTS AND DISCUSSION

Physical and Chemical Properties:

This study noticed that the water temperature was increased in the summer, starting from April until October. And the highest recorded temperature was observed in July at all the stations but it was more pronounced in station S2. This increase in water pH might be due to an increase in the level of CO2 in the water as a result of increases of the Zooplankton activity in this time of the year [16]. This possibly because the increase in the ability of the CO2 to dissolve in a low temperature as results a Carbonic acid might be generated which cause this decrease in the pH during winter [22]**.** The current study agreed with previous studies on other river water in Iraq because of the abundance of bicarbonate and carbonate ions [23] and [16] .

The electrical conductivity (EC) depends on the concentration of the ionic substances that are dissolved in the water sample, also it depends on the temperature of the water. [24]. The highest value was 2.67 mS /cm recorded in April 2017 at station S3. The concentration of dissolved oxygen in water can be affected by several factors such as daily and seasonal changes in the in temperature, the density of living organisms, type of the water and organic contamination [23]. In addition, the increasing of organic lysis is more pronounced in this time of year, which might lead to an increase in oxygen consumption [25]**.** The results of the current study showed an increase in the B.O.D in the summertime, while lower values of B.O.D were noticed in winter. This increases in the B.O.D is maybe due to abundance in the organic materials in present of good ventilation, this could promote to increase in the oxygen level [23].

The taxonomic and quantitative study of Copepods:

A total of 5 taxa were classified as common taxa with 38.4% of the taxonomic units that were diagnosed from Copepoda during the study period. Also, this study recorded 12, 9 taxonomic units at station S1, S3

respectively, and 6 taxa were found in the station S2 which is the lower numbers between other stations Table 2, 3 and 3. Only *Macrocyclops sp*., and *Halicyclops sp*. were noticed at station S1, while mesocyclops leucarti., and Lernaea sp. were observed in S1 and S3. The most common genera were Cyclops in the studied time and it was 3 taxonomic units. C*yclops Scutifers* and *Cyclops Scutifers* were noticed in all the three stations. This study noticed a significant difference of some species from one station to another, this might due to the major difference in temperature, salinity, dissolved oxygen, and pH. In addition, the Copepoda and its adult stages might enter into the hibernation phase which could explain their disappearance in some months. Figure 1 shows that the highest monthly densities recorded during the spring months of 2017 and the months of September, October, and November of the same year. This indicates that there are two peaks of density, similar to what was founded by [16] in the Diwaniyah River.

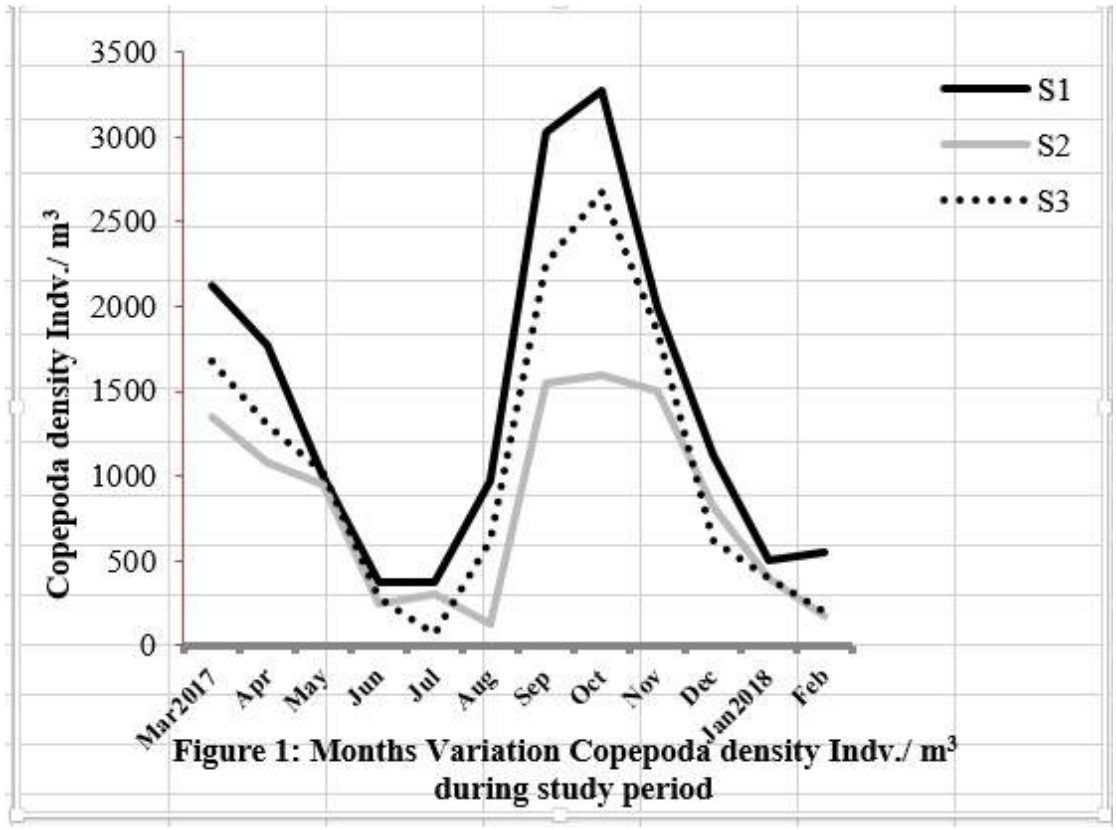

Figure 1: Months Variation Copepoda density Indv./ m^3 during study period

The Similarity Index and Species Diversity:

Sorensen Similarity: For comparing the similarity of studied stations (taxa composition), Sorensen Similarity was used for this purpose[18]. The highest value was recorded 76.2 in this study was between stations S1 and S3 using Sorensen Similarity statistic tool table 1.

Table 1: Sorenson similarity index (%) of three stations

Stations	Sorenson similarity index (%)
S1,S2	66.7
S1,S3	76.2
S2,S3	66.7

The frequency (F %) : The frequency of Copepoda occurrence taxa were calculated by using the F index which described by [27] were classified in: Constant species (F > 50%), Common (10 < F < 49%) and Rarely species (F < 10%). Table 2. The highest number of species in the stationS1 was recorded during March, September, October, and November in 2017, with the number of 12 species. The current study showing that the lowest species recorded during the summer months in all study stations. Table 2,3and 4.

(+) = detected

Table 2: Monthly Abandons and (The frequency F %) of Copepoda species in Station S1.

Taxa	2017										2018		(F%) INDEX
	M	A	M	J	J	A	S	O	N	D	J	F	
Copepoda													
Calanoida													
Diaptomus fraciscanus	+	+	+	+		+	+	+	+	+	+	+	100 %
Cyclopaedia													
CyclopsScutifers	+	+	+		+	+	+	+	+	+			100%
C.venstus	+	+					+	+	+	+			100%
C.vicinus	+		+				+	+	+	+		+	8%
Eucyclops agalis	+	+	+				+	+	+	+		+	15%
E. macrurus													8%
Halicyclops sp.	+	+		+		+	+	+	+	+			8%
Macrocyclops sp.	+	+	+				+	+	+		+		8%
Mesocyclops leuckarti	+	+	+	+			+	+	+		+	+	15%
Paracyclops affinis	+	+	+				+	+	+				15%

Table 3: Monthly Abandens and (The frequency F %) of Copepoda species in Station S2.

Taxa	2017										2018		(F%) INDEX
	M	A	M	J	J	A	S	O	N	D	J	F	
Copepoda													
Calanoida													
Diaptomus fraciscanus	+	+	+	+			+	+	+	+	+	+	100%
Cyclopaedia													
CyclopsScutifers	+	+	+		+	+	+	+	+	+			100%
C.venstus	+	+	+				+	+	+	+			100%
C.vicinus													8%
Eucyclops agalis	+	+	+				+	+	+	+		+	15%
E. macrurus													8%
Halicyclops sp.													8%
Macrocyclops sp.													8%
Mesocyclops leuckarti													15%
Paracyclops affinis													15%
Paracyclops fimberiatus	+	+	+	+			+	+	+	+	+		100%
Parasitic copepods													
Lernaea sp.													15%
Copepoda nauplii	+	+	+	+	+		+	+	+	+	+	+	100%
Total Taxa	6	6	6	3	2	1	6	6	6	6	3	3	

(+) = detected

Table 4: Monthly Abandens and (The frequency F %) of Copepoda species in Station S3.

Taxa	2017										2018		(F%) INDEX
	M	A	M	J	J	A	S	O	N	D	J	F	
Copepoda													
Calanoida													
Diaptomus fraciscanus	+	+	+			+	+	+	+			+	100%
Cyclopaedia													
CyclopsScutifers	+	+	+		+	+	+	+	+	+			100%
C.venstus	+	+					+	+	+	+			100%
C.vicinus													8%
Eucyclops ages													15%
E. macrurus			+	+	+				+				8%
Halicyclops sp.													8%%
Macrocyclops sp.													8%%
Mesocyclops leuckarti	+	+				+	+	+	+			+	15%
Paracyclops affinis	+	+		+	+		+	+	+		+		15 %
Paracyclops fimberiatus	+	+	+	+			+	+	+	+	+		100%
Parasiticcopepoda													
Lernaea sp.	+	+	+	+	+		+	+	+		+	+	15 %
Copepoda nauplii	+	+	+	+		+	+	+	+	+	+	+	100%
Total Taxa	8	8	6	5	4	4	8	8	9	4	4	3	

(+) = detected

Species deficit: The species deficits among the three stations were applied during the study time, and it was between (S1, S2), (S1, S2) and (S3, S2) as in (table 5).

Table 5: Specific deficit among the stations:

Stations	Species deficit %
S1,S2	50%
S1,S3	25%
S3,S2	33%

Species Diversity: This study evaluated the biodiversity of all three stations, and the results showed a decrease in the species diversity of Copepods during the study period.

It has been reported that the biodiversity of some species of plankton can be affected by physical and chemical changes and pollution [16]. The diversity and density of zooplankton are negatively affected by the presence of contaminants that reach the rivers of the Euphrates River at the city of Samawah directly without treatment or refining [28].

CONCLUSION

In the current study was observed a significant increase in the density of the species during the studied period. A significant correlation also noticed between the number of individual and Water Temperature, Dissolved Oxygen, pH, Salinity and the organic content of bottom sediments. In conclusion, this study provides a decent data about the prevalence and density of different species of Copepods in the study area during the different time of the months of study.

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Ethical Clearance: The study was approved by the Iraqi Medical Ethics Committee in the University of Muthanna, Iraq.

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Sociodemographic the Characteristics of "Slum and Urban Area"Customer Behavior Depot and Identification of Escherchia Coli with RT-PCR by Gen EF-Tu

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ABSTRACT

Reverse Transcription Polymerase Chain Reaction (RT-PCR) Is a process that takes place in the presence of an additional cycle namely the change of RNA to cDNA (complementary DNA) using the Reverse Transcriptase enzyme .. EF-Tu is a prokaryotic prolongation factor that plays a key role in genetic translation by connecting with aminoacylated tRNAs that carry amino acids to the ribosome. The purpose of this study was to identify the EF-Tu Bacteria Escherchia coli gene in refill drinking water. The research design was observational with quasy experiment method. As for the sample, there were 5 depots in the Mario district (slum are) and in Panakkukang district (urban area) with a total sample of 30 samples measured on inlets, processes and outlets. Boom DNA extract method, DNA amplification by RT-PCR, PCR product detection, the results obtained in the form of RNA black band pattern (RNA band) where the electrophoresis results obtained RNA band (RNA band) at 470 bp. The result show that sifgnificant relationship between customer behavior and depot on quality measurement of refill drinking water. RT-PCR on EF-Tu gene can be used to detect bactery Escherchia coli quickly and more accurately the results obtained**.**

Keywords: *EF-Tu, RT-PCR, Escherchia.coli,*

INTRODUCTION

The fulfillment of drinking water and sanitation facilities according to WHO in Indonesia is still low compared to other countries in Southeast Asia. It is estimated that Indonesia's population in 2015 is 218 million, of which 103 million or 47% do not have access to sanitation and 47 million people or 22% do not have access to clean water. Larger numbers are seen in rural populations, where an estimated 62% or 73 million people do not have access to sanitation and 31% or 36 million people who do not have access to clean water.[1]

The fulfillment of the quality of healthy drinking water needs to get great attention because it concerns the lives of many people. if this problem does not receive serious attention, it will certainly cause more problems later in life such as diarrhea[2]. In the process of packaging or refilling drinking water refill, re-pollution can occur if the officers do not pay attention to sanitation of the equipment and place even individual hygiene of each depot officer. Usually there are bacteria that contaminate refill drinking water because the tank is not clean.[3]

Escherichia coli is a bacteria that normally lives in human digestion and warm-blooded animals are even permanent residents. This coli class of bacteria is used as an indicator of water pollution, because it is easy to find in a simple, harmless way, has a short survival compared to other pathogenic bacteria. The types of E. coli bacteria found in drinking water include: EIEC EHEC EAggEC EPEC ETEC[5]. The presence of bacteria is not related to sanitation hygiene and personal hygiene.[6]

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Polymerase Chain Reaction (PCR) is one technique that is able to multiply a sequence of 105-106-times the number of nanogram template DNA in a large background on irrelevant sequences (for example from total genomic DNA Reverse Transcriptase is an enzyme that can synthesize DNA molecules in vitro use the RNA template.[7] EF-Tu is one of the prokaryotic elongation factors.The elongation factor is part of the mechanism that synthesizes new proteins by translation in the ribosome.[8] In this mechanism, individual amino acids are linked to proteins that develop by transferring RNA which also fits the messenger RNA chain.The ribosome makes the protein follow the codon sequence the mRNA presents and facilitates the subsequent binding of the tRNA with the bound amino acid.[9] EF-Tu participates in the polypeptide elongation process of protein synthesis. In prokaryotes, the main function of the EF-Tu is to transport aa-tRNA is correct to A-site ribo som. As a G-protein, it uses GTP to facilitate its function[10].

EF-Tu prokaryotic factors help aminoacyl tRNA move to free sites in the ribosome. In the cytoplasm, the EF-Tu binds to a charged (aminoacillation) tRNA molecule; and this complex then enters the ribosome. EF-Tu is a prokaryotic elongation factor that plays a key role in genetic translation by connecting with aminoacylated tRNAs that carry amino acids to the ribosome. EF-Tu is GTPase whose hydrolysis activity is paired with the codon step in mRNA.[9]

The business of drinking water depots that is growing rapidly today has an important meaning in the provision of drinking water that is affordable by the community. From various studies it is known that there are several factors that can cause a decrease in the quality of drinking water depots, among others, the ignorance of the drinking water depot owners / operators regarding the handling of raw water quality, improper management and use of filters and disinfection equipment. To be directly consumed, drinking water produced by drinking water depots must meet health requirements.[11]

Based on a preliminary survey conducted that several refill drinking water depots (DAMIU) in Panakkukang Subdistrict and mariso District of Makassar City were seen from a physical perspective, they did not meet the standards and DAMIU had not done the processing correctly and correctly. In addition to handling processed water, the type of equipment used, as well as the absence of routine checks on the quality of drinking water produced [12].

Based on this description the purpose of this study was to determine the Sociodemographic Characteristics "slum and urban area" customer behavior depot and Identification of bactery *Escherchia coli* With RT-PCR By Gen EF-Tu

METHOD

Design research is observational mixed quasy experiment method to identify the presence of pathogenic Escherichia coli bacteria as an indicator of the quality determination of refill drinking water with Reverse Transcriptase – PCR (RT-PCR) technique with EF-Tu target gene. The population in this study were 10 refill drinking water in the Mariso and Panakukang sub-districts. Examination of the sample was carried out in the Laboratory of immunology and microbiology of UNHAS medical faculty.

Table 1 Sequences and Positions of Primary Nucleotides

Gen	Forward	Reverse	Size (bp)	Acsess nuMBERwe
EF-II	5'CGCTGGAAGGCGACGCAGAG 3' (From 1253)	5'CGGAAGTAGAACTGCGGAACGGTAG3 (From 1698)	470	X57091

Tools and materials

The tools used in this study were sample bottles, cool boxes, incubators, safety cabinets, vortex shakers, gyrotary shakers, Eppendorf tubes and shelves, centrifugation devices, dispossibel gloves, micropipets, thermocyclers (Hybaid, Ashford, UK), freezer -20 ºC, 4ºC refrigerator, electrophoresis machine, UV light.[13]

Materials

for sampling are 70% alcohol, cotton and materials for DNA extraction, namely Diatom suspension, L6 (Lysis buffer) solution, L2 (Washing buffer) solution,

70% ethanol, acetone and TE (Tris-EDTA) solution elution buffer. The ingredients used for PCR were DNA extract, PCR mix (100 mM Tris-HCl, Ph 8.3, 1.5 mM MgCl, 50 mM KCl, 0.1% gelatin), deoxynucleotide triphosphate (dNTP), dATP, Materials for electrophoresis are 1.5% agarose gel containing 0.5 mg / Lethidium bromide, Tris acetic acid-EDTA electrophoresis buffer (242 g Tris Base, 57 mL acetic acid, and 100 mL of 0.5 mol / L EDTA, pH 8.0) .[14]

DATA ANALYSIS

The results of PCR detection by electrophoresis were analyzed based on whether or not the pieces on the DNA band (DNA band) were formed and the data were presented descriptively using tables and images.

RESULT

According to table 2 from 30 depot customer respondents in Kec Panakukang generally were 15 women (100%), education of depot customers in Mariso Subdistrict and most Panakukang sub-districts were 9 (46.7%) and 10 (66, respectively) 7%).

Table 2: The Characteristics of Respondents Customers Refill Drinking Water Depots

Location	Type of variable N		Total	
			%	
Slum area	Sex	Men	1	6,7
		Women	14	93.3
	Education	Yunior high school	6	33,3
		Senior high school	9	46,7
		Schoolar	0	20,0
Urban area	Sex	Men	0	0
		Women	15	100
	Education	Yunior High School	2	13,3
		Senior High School	10	66,7
		Schoolar	3	20

Based on table 3, AMIU's storage time is at the highest number of houses, namely the old category (≥ 4 days) in Mariso (slum area) and Panakukang (urban area), respectively 8 (53.3%) and 7 (46.7%).

Table 3: Characteristics of the Length of Storage of Drinking Water at Home

Location	Variable	N	%
Slum area	long (≥4 days)	8	53,3
	medium (3 days)	4	26,7
	Enough (≥2days)	3	20
Urban area	Long (≥4 days)	7	46,7
	Medium (3 days)	5	33,3
	Enough (≥2 days)	3	20

Based on table 4 shows that the behavior of depot customers is based on the level of knowledge about bactericoliform whole which does not meet the requirements 18 (100%), negative customer behavior of depots and does not meet the requirements of 13 (87,7%). and depot customer actions and did not meet the requirements of bacteri coliform presence as much as 21 (84,0%)

Table 4: Relationship Between Behavior Of Depot customer depot With Identification Of Bacteri coliform

Type variable		Bacteri coliform (Ouput)						*p*
	Not Eligible		Eligible		N	%		
	N	%	n	%				
Knowledge	Less	18	100	0	0	18	100	0,002
	Enough	6	50	6	50	12	100	
Actitude	Negatif	13	87,7	2	13,3	15	100	0,651
	Positif	11	73,3	4	26,7	15	100	
Behavior	less	21	84,0	4	40	25	100	0,254
	Good	3	60	2	40	5	100	

Analysis RT-PCR in the gene EF-Tu found in the samples A. 13 (positive *Escherichia Coli*) while the other samples undetected, as shown in table 5

Table 5: Results of RT-PCR *Escherichiacoli* 16S RNA-gene on DWRS in district Mariso

Slot	Sample Code	RT-PCR Results	NOTE
1	Marker	-	
2	A. 1.1	(-)	Not detected
3	A. 1.2	(-)	Not detected
4	A. 1.3	(+)	Detected
5	A. 2.1	(-)	Not detected
6	A. 2.2	(-)	Not detected
7	A. 2.3	(-)	Not detected
8	A. 3.1	(-)	Not detected
9	A. 3.2	(-)	Not detected
10	A. 3.3	(-)	Not detected
11	A. 4.1	(-)	Not detected
12	A. 4.2	(-)	Not detected
13	A. 4.3	(-)	Not detected
14	A. 5.1	(-)	Not detected
15	A. 5.2	(-)	Not detected
16	A.5.3	(-)	Not detected
17	Negative Control	(-)	Not detected

Analysis RT-PCR in the gene EF-Tu found in the samples b. 2.1, b. 2.2 and b.3.3 (Positive *Escherichia Coli*) while the other samples undetected as shown in table 6

Table 6: Results of RT-PCR *Escherichia coli* EF-Tu RNA-gene on DWRS in district Panakukkang

Slot	Sample Code	RT-PCR Results	NOTE
1	Marker	-	
2	B. 1.1	(-)	Not detected
3	B. 1.2	(-)	Not detected
4	B. 1.3	(-)	Not detected
5	B. 2.1	(+)	Detected
6	B. 2.2	(+)	Detected
7	B. 2.3	(+)	Detected
8	B. 3.1	(-)	Not detected
9	B. 3.2	(-)	Not detected
10	B. 3.3	(-)	Not detected
11	B. 4.1	(-)	Not detected
12	B. 4.2	(-)	Not detected
13	B. 4.3	(-)	Not detected
14	B. 5.1	(-)	Not detected
15	B. 5.2	(-)	Not detected
16	B. 5.3	(-)	Not detected
17	Positive Control	(-)	Not detected

DISCUSSION

EF-Tu is part of the mechanism that synthesizes new proteins through translation in the ribosome. RNA transfer (tRNAs) carries individual amino acids that are integrated into protein sequences, and have anticodons for the specific amino acids they fill. Messenger RNA (mRNA) carries genetic information that encodes the main structure of proteins, and contains code that encodes each amino acid. The ribosome creates a chain of proteins by following the mRNA code and integrating the aminoacyl-tRNA amino acid (also known as charged tRNA) into the growing polypeptide chain.

Together with ribosomes, EF-Tu is one of the most important targets for inhibition of antibiotic translation. Antibiotics that target EF-Tu can be categorized into one of two groups, depending on the mechanism of action, and one in four structural families. The first group included antibiotics pulvomycin and GE2270A, and inhibited the formation of ternary complexes. The second group included the antibiotics chirromycin and enacyloxin, and prevented the release of EF-Tu from the ribosome after hydrolysis of GTP. [15]

With the contamination of *E. coli* bacteria in raw water in Panakukkang, due to the non-functioning of one of the processing equipment at the depot, the quality of the drinking water produced will not be different from the raw water that has not been processed, especially the content of E. coli bacteria. The ineffectiveness of ozonation at the time of processing can affect the quality of treated drinking water. Drinking water that is processed without ozonation can cause Coliform16 bacteria to grow rapidly, so that drinking water at the depot can be contaminated with Coliform[16] bacteria. Especially if the processed drinking water has been stored for more than three days, the bacteria will continue to multiply in processed water. that. This is because the growth of bacteria in the water is very fast. Within 2 to 3 days Coliform bacteria can contaminate drinking water because during the ozonation process when processing is not effective.[17]

Handling of containers carried by consumers also plays an important role in influencing water quality. Even if the quality of the water produced is good but the handling of containers is not considered, it will reduce water quality because contamination can occur from

outside the production process. Good handling is done by washing using various types of special detergents which we call food grade and clean water with temperatures ranging from 60-85 ° C, then rinsed with enough product water to remove detergent residues used for washing.[18]

All depots that were sampled in Mariso Subdistrict did not handle the containers carried by the buyer in accordance with the regulation. The most common method used by most depots now is to brush and rinse with product water afterwards, then fill it immediately. In Mariso sub-district, 38.46% of the samples were brushing and rinsing and 60% of them produced drinking water with quality according to the regulations while the rest showed positive results. While the depot only rinsed, which was 46.15%, all the drinking water produced contained coliform bacteria. The rest of the depots who do not brushing and rinsing the container of the buyer are found to have total bactericoliform content.

CONCLUTION

There is a sifgnificant relationship between customer depot behavior and quality measurement of refill drinking water. RT-PCR genome in EF-Tu gene was found to be positive for Bacteria *Esherchia coli* both in slum and urban area in 470 bp.

Ethical Clearance- Taken from Hasanuddin University Ethics Committee, approval number: 195 / H4.8.4.5.31 / PP36-KOMETIK / 2017.

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Prevalence and Determinants of High-Risk Women in Pregnancy, Labor and Postpartum with Premarital Screening in Semarang City, Central Java, Indonesia

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ABSTRACT

Introduction: Maternal Mortality Rate (MMR) is among health indicators in Indonesia. According to IDHS, in 2012 MMR increased to 359 maternal deaths per 100,000 live births but according to SUPAS in 2015, MMR decreased to 305 maternal deaths per 100,000 live births. Maternal Mortality Rate (MMR) in Semarang city is mostly (77%) caused by puerperium. The purpose of this study is to investigate factors affecting maternal mortality in pregnancy, labor and high risk particularly in Semarang City.

Material and Method: This study was conducted in Semarang City of 37 Puskesmas , conducted surveys and observations by using screening for pregnancy women, labor, postpartum and analyzed bivariate and multivariate with logistic regression.

Findings: The factors correlations with premarital screening were maternal secondary infertility risk p-value 0.013 and postpartum haemorrhage with placental retention with p-value of 0.04. The most influential factors with premarital screening that were only partially weakly affected were pregnant with chronic hypertension (OR = 0.39), delivery with history of SC (OR = 0.14), postpartum with placental retention (OR = 0.09) and secondary infertility (OR = 0.05)

Conclusion: Factors influencing high risk for women an effect on morbidity and mortality, in this case are infections in postpartum women with a frequency of 92.4 %. So it is very necessary promotion and preventive efforts with appropriate health care for women preconception. As well as the existence of a comprehensive program premarital with attention to patient privacy and approval of both patients.

***Keywords**: Pregnancy, Labor, Postpartum, High Risk, Screening*

INTRODUCTION

According to WHO data, 99 percent of maternal deaths due to labor or birth problems occur in developing countries. The maternal mortality ratio in developing countries is the highest with 450 maternal deaths per 100,000 live births compared to the maternal mortality ratio in nine developed countries and 51 commonwealth countries. However, data from WHO, UNICEF, UNFPA and the World Bank show maternal mortality to date is still less than one percent per year. In 2005, 536,000 women died due to labor problems, lower than the number of 576,000 deaths in 1990[1]. Death during pregnancy or within a period of 42 days after the end of pregnancy, due to all causes associated with or aggravated by pregnancy or handling, but not caused by an accident/injury. The success of the health effort of one sensitive indicator in a country's people is maternal mortality. According to the data of the 2012 SDKI that increased MMR to 359 maternal deaths per 100,000 live births but according to SUPAS 2015 results, MMR

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decreased to 305 maternal deaths per 100,000 live births.

In addition from the data of Maternal Mortality Rate (MMR) in Semarang City many causes are pre-eclampsia, bleeding and others, 77% of bleeding in the puerperium where the city of Semarang ranked second after the city of Brebes in terms of [1]. In the health service close to the community is Puskesmas which is a health facility that serves primary services in public health in a preventive and promotive and affordable for all community groups.

Puskesmas is a health service facility that organizes public health efforts and individual health efforts of the first level, by prioritizing promotive and preventive efforts, to achieve the highest degree of public health in its working area[26].The number of Puskesmas in Semarang city are 37 *puskesmas* can have potential in conducting survey on women with high-risk pregnancy, mothers with high-risk pregnancy and restrictive mother [1]. So it is necessary once the study of the picture for the causes of factors that influence maternal, labor and postpartum become high risk.

MATERIAL AND METHOD

The research method used survey. Survey is one of the research approaches that are generally used for large and multiple data collection. This study was conducted on large populations. Survey research is used to gather information form opinions from a large number of people on a particular topic. There are three characteristics of survey : information is gathered from a large group of people to describe some aspect or certain characteristics, the submission collect of either written or oral questions of a population, information obtained from the sample, not from the population. Survey research is not only intended to determine the status of symptoms, but also to determine the similarity of status by comparing it with the standard that has been selected or determined. In addition, also to prove or justify a hypothesis [2]. The sample in this study were patients who performed the examination of pregnancy, labor, and postpartum at 37 *Puskesmas* Kota Semarang, Central Java, Indonesia in 2017.

Data will be input using SPSS version 17.00. The frequency of distribution is based on the category of screening in pregnant women with high-risk. Survey results are presented with tables and frequencies. The most influential factor by using factor analysis is multiple regression. The data analysis used bivariate and multivariate with logistic regression.

FINDINGS

Total of 37 *Puskesmas* surveys in 1 year showed that the highest risk pregnant women secondary infertility pregnant 2nd> 5 years as many as 5543 (25.54), seen from pregnant mother or suffering high risk most pregnant women with history of chronic hypertension equal to 714 (36.2), birth history the greatest complication of 3647 (88.1) of birth reports was SC, the biggest complication of delivery was severe Preeclampsia of 22 (33.8), postpartum haemorrhage in the puerperium most with retained placenta of 13 (50) and puerperal infections with the highest number of cases sepsis of 5 (71.4).

Tabel 1 Premarital Screening In Puskesmas Semarang City were:

Premarital Screening Test	**N(%)**
Comprehensive Test	15 (40.5)
Partial Test	22 (59.5)
Total	**37(100)**

Table 2 showed that from the total 37 Puskesmas, 15 (40.5%) carried comprehensive screening test, and 22 (59.5%) carried partial screening test. In the comprehensive test, there were laboratory test, comprehensive physical and psychical test proved by anamnesis, TT immunization and in the partial test, the health center provided PP test, HIV rapid test, Hb rapid test, HBsAg rapid test and TT immunization.

Table 2: Bivariate With Premarital Screening in Public Health Center Semarang :

Variable	**Coefficient**	**p-value**
Secondary Infertility	6.182	0.013
Pregnant history chronic hypertension	.778	0.378
History SC	2.754	0.097
Labor Severe Preeclampsia	.028	0.867
Postpartum haemorrhage with retained placenta	4.185	0.041
Postpartum infection	.334	0.563

Table 2 shows the correlation premarital screening at the Puskesmas Kota Semarang with p-value <0.5 is with the mother secondary infertility 2nd>5th risk factor with p-value 0.013 and postpartum haemorrhage bleeding with retained placenta of p-value 0.041.

Table 3 Results of Multivariate Logistic Regression Analysis

	Variable	Koefisien	P	OR (IK 95%)
Step 1	Secondary Infertility	-.019	0.048	0.98(0.96-1)
Partial Test	Pregnant history chronic hypertension	.026	0.391	1.03(0,97-1)
	History SC	.011	0.138	1.01(0.99-1)
	Labor Severe Preeclamsia	-.088	0.867	0.92(0.33-2.56)
	Postpartum haemorrhage with retained placenta	1.314	0.083	3.72(0.84-16.5)
	Postpartum infection	-.897	0.562	0.41(0.02-8.5)
Step 2	Secondary Infertility	-.028	0.046	0.98(0.88-0.98)
Partial Test	Pregnant history hipertension cronic	.029	0.388	1.01(0,95-1,22)
	History SC	.013	0.135	1.01(0.99-1)
	Postpartum haemorrhage with retained placenta	1.311	0.086	3.69(0.82-15.3)

The result according Table 3 that the variables affecting premarital screening are secondary infertility 2nd>5th, pregnancy with chronic hypertension, delivery with history of SC and postpartum with retained placenta. The strength of the relationship from the largest to the smallest was pregnant with chronic hypertension (OR = 0.39), delivery with history of SC (OR = 0.14), postpartum with placental retention (OR = 0.09) and secondary infertility (OR = 0.05). With very weak links with the partial test.

The variables were linked bivariately with premarital screening at the Puskesmas Semarang City, the results showed a premarital screening relationship with maternal secondary infertility risk and postpartum haemorrhage with retained placenta. So we can know the risk factors that need to be prepared in the premarital is about secondary infertility and postpartum haemorrhage with retained placenta. So with knowing the results need to be done prevention and preparation for premarital women to prepare the design of pregnant planning in healthy reproductive age (20-30 years) [5]. The cases mainly related to the mother age which was considered into post healthy reproductive period, so that there were more risk factors during the pregnancy and delivery which may lead to baby defect, baby stuck, and bleeding [20]. The preparation of nutrients that can improve a woman's fertility later. And also sometimes there is the impact of infertility in women if there is a history of abortion with induction and postpartum infections so it is expected when premarital screening can be informed so that it can be planned better conditions [21]. According to another research secondary infertility can occur because of a lot of parity and the causes of infertility that interfere with female reproduction [22].

Prevention of postpartum haemorrhage with retained placenta by taking into account the nutrients that can increase hemoglobin and vitamin Fe consumption in the prevention of blood deficiency in women before marriage [7]. Also, the need for vitamin C can help prepare the needs during pregnancy and breastfeeding by 95 mg/

day[6]. In addition, in preventing cases for premarital it is also advisable to consume folic acid, vitamin B12 in the decrease of anemia, as many premarital women have anemia and hypermenorrhoea supported by the lack of vitamin consumption, dietary patterns and decreased meat consumption[8]. In addition, anemia can be prevented by a combination of iron fortification of the appropriate food combined with iron supplements in certain population groups has proven to be efficient [24]. So it can be used as a premarital screening program in the prevention of postpartum haemorrhage with retained placenta. The preparation given to the premarital can help premarital women begin to pay attention to his health later life during pregnancy, maternity labor and postpartum. The preparation to prevent that women with multiparity will be at risk of postpartum haemorrhage with retained placenta [23].

The expected that experts also play a role in helping the promotion of health with these important messages with media that are interesting and easy to understand every woman who reads can be through premarital classes, attractive leaflets, banners that can make women have a habit of continuing with the health of reproduction [10]. In addition, there is also a program of knowledge of premarital women in reducing the expectation of idealistic marriage is the most important health between couples, and it is very effective to inculcate teenagers in looking for a good and healthy partner [13]. Premarital health education can helpful for women to always care about health besides the above risks also need health education about healthy sex, HIV / AIDS, and hepatitis because it is a contagious disease and at risk later when married[14].

In addition to these findings after multivariate data processing, it was found that with premarital screening, the most significant effect of this study was the most influential sequence of pregnant chronic hypertension (OR = 0.39), delivery with history of SC (OR = 0.14), postpartum with retained placenta (OR = 0.09) and secondary infertility (OR = 0.05). The results show that the risks that can be answered by screening are in part only 4 of the 6 biggest risks in a mother and have not responded to the influence of all risk.

The incidence of the risk that causes the death of the mother can be prevented and the standard of service in providing premarital counseling in preparing healthy reproduction and healthy family planning. As well as in the premarital screening program, the human rights should be kept secret for health data, but apart of screening premarital screening is concerned with the agreement of both patient, but it is worth noting that premarital screening has a good purpose that is effectively used in the prevention of spreading disease and survival of individuals and communities[11]. In other countries, the premarital screening program is very successful and has significantly improved which is better seen from the interpersonal skills and overall relationship quality[12]. Premarital programs are needed knowledge and attitude toward voluntary screening of marriage because all require awareness of each individual so it is necessary once health promotion about it if the premarital screening program is successful and has a very good impact[15]. This premarital education program is also very effective in improving the quality of couples before marriage and can become a reference partner later in forming a healthy family[16]. Premarital counseling can be done with the cooperation of religious clerics in will marry couples by providing advice that can strengthen into a better family[17]. The couples will be better prepared in the deal of marriage later so that the need for experienced providers to be effective in providing premarital counseling[18]. In addition, premarital screening program is very effective in detecting hemoglobinopathies that impacted later when pregnant, but many couples continue their marriage and always check up the disease so it becomes the preventive breakthrough for couples for the importance of premarital screening [19]. The relevancy of premarital screening in mental health for the improvement of health services with expert resources in mental psychology [25].

CONCLUSION

The factors correlations with premarital screening were maternal secondary infertility risk p-value 0.013 and postpartum haemorrhage with retained placenta with p-value of 0.04. The most influential factors with premarital screening that were only partially weakly affected were pregnant with chronic hypertension (OR = 0.39), delivery with history of SC (OR = 0.14), postpartum with retained placenta (OR = 0.09) and secondary infertility (OR = 0.05).

Conflict of Interest : There is no

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Ethical Clearance: The ethical issue of the Medical Research Bioethics Commission of Medicine Faculty of Medicine Universitas Sultan Agung Semarang Central Java Indonesia.

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Mothers' Behaviour Regarding School-Aged Children's Nutrition: in Indonesia

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INTRODUCTION

Malnutrition in school-aged children in the coastal area of Indonesia, increased every year. This can be caused by improper nutrition intake. Such as in Bulak Banteng Village, East Java, presumably, it was mothers' behaviour in providing children's nutritional needs that caused the malnutrition. This research aimed to evaluate factors which influenced mothers' behaviour in the coastal area of Indonesia in the fulfilment of school-aged children's nutrition based on health promotion model. **Method:** This was an observational analysis study with a cross-sectional approach. Samples were 100 mothers of school-age children who lived at Bulak Banteng Village, East Java, Indonesia. Samples were taken by using a stratified random sampling technique. Independent variables were mother's prior related behaviour, self-motivation, perceived benefits, perceived barriers, perceived self-efficacy, activity-related affect, and commitment in fulfilling nutrition. The dependent variable was the mother's behaviour in fulfilling nutrition. The data were collected by using questionnaire, then analysed by using linear regression. **Result and Analysis:** Linear regression analysis indicated that motivation ($p=0.020$), perceived barriers ($p=0.000$), self-efficacy ($p=0.003$), and activity-related affect ($p=0.000$) were influenced mother's behaviour in fulfilling school-aged children nutrition by $p<0.05$. **Discussion:** Mother's motivation, self-efficacy, and activity-related affect have a role in mother's behaviour in fulfilling school-aged children nutrition. Nurses should create health promotion which can increase mother's motivation, efficacy, and affect in fulfilling school-aged children nutrition.

Keywords: *health promotion model, mothers' behaviour, nutrition, school-aged children*

INTRODUCTION

Indonesia is facing a double burden of malnutrition on school-age children with the prevalence of underweight and obesity increasing. Malnutrition has negative effects on health and quality of life[(1)]. Data from Basic Health Research (Riskesdas) in 2007 shows that malnutrition exists in children less than 6-14 years old: 13.3% male and 10.9% female [(2)]. This increased in 2013 for both men and women by 11.2%.

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Health Survey Result of Basic Elementary Students in Surabaya city by 2015 showed that from 52,865 elementary school children, there were 2,057 children with malnutrition. The prevalence of hunger malnutrition in the work area of Puskesmas Bulak Banteng is the second highest in Surabaya City, that is equal to 33.26%[(3)].

Bulak Banteng Village was located on the coastal area of Surabaya, near Madura Strait. People in this village were living in a slum area with a poor economic condition and a low level of education[(4)]. The previous study using an interview on ten mothers who live at Bulak Banteng Village find that eight mothers said their only take 1-2 meals per day (missed breakfast), mother cooks as their children request, although it is less nutritious. The kind of food which is often consumed was rice with fried egg only. There

were 7 out of 10 mothers said that their child didn't like vegetables and fruits[5].

Malnutrition directly caused by inadequate dietary intake and disease, indirectly caused by parenting style, food availability, social-economy, culture, and politic[6]. Malnutrition reflects imbalanced nutrition between intake and needs[7]. If it's not treated immediately, it can cause physical growth and intellectual development failure, reduce productivity, reduce endurance, increase child morbidity, and death.

Many factors can influence mothers' behaviours in meeting the nutritional requirement of their children. Factors that affect the mother in the fulfilment of nutrition can be associated with a behavioural model, one of it was the Health Promotion Model. The Health Promotion Model (HPM) is a theory that explores factors related to health promotion behaviours aimed at improving health and quality of life[8]. In HPM, health behaviour can appear if there is a commitment to do, not because of the perception of threat. Commitment can be influenced by behaviour specific cognition and affect (perceived benefit, perceived barrier, perceived self-efficacy, and activity-related affect). Behaviour specific cognition and affect can be influenced by prior related behaviour and personal factors (such as motivation)[9].

Although previous research has identified factors contributing to mothers' behaviours in feeding their children, little is known about these factors within the context of HPM. It is important for nurses to know the factors that influence mother's behaviour in nutrition fulfilment of school-aged children so that nurses can plan appropriate health promotion strategies for mothers. Therefore, the authors are interested in examining the factors that influence mother's behaviour in nutrition fulfilment of school-age children with HPM approach.

METHOD

This was an observational analytic study with a cross sectional approach. The population were mothers with school-age children, who take care their children without household assistance, who lived at Bulak Banteng Village, East Java, Indonesia. One hundred respondents were involved by using stratified random sampling technique.

Independent variables in this research were mother's prior related behaviour, self-motivation, perceived benefits, perceived barriers, perceived self-efficacy, activity-related affect, and commitment in fulfilling nutrition, which is collected by using questionnaire. The dependent variable was the mother's behaviour in fulfilling nutrition, which is collected by using food frequency questionnaire. The data were then analysed by using linear regression. Statistical testing was performed at the 0.05 significance level.

RESULTS

Most of the respondents were middle adult mothers, with age range 35-45 years old (87%). Mostly were only elementary school graduates (49%). More than a half was a housewife (55%), with a monthly salary less than local minimum wages (64%). Most of the children who participate in this research were 2nd years elementary school's students, mostly nine years old (29%). More than a half were female (55%). Most of them were malnourished (73%).

Table 1 The relationship between independent and dependent variables (n = 100)

Variables	Mother's behaviour in fulfilling nutrition				Total	
	Good		Poor			
	n	%	n	%	n	%
Prior related behaviour						
Good	35	35	23	23	58	58
Poor	25	25	17	17	42	42
Self-motivation						
Strong	36	36	29	29	29	29
Weak	24	24	11	11	11	11
Perceived benefit						

Cont.... **Table 1 The relationship between independent and dependent variables (n = 100)**

Positive	22	22	22	22	44	44
Negative	38	38	18	18	56	56
Perceived barrier						
Barrier	27	27	30	30	57	57
None	33	33	10	10	43	43
Perceived self-efficacy						
Strong	29	29	24	24	53	53
Weak	31	31	16	16	47	47
Activity related effect						
Positive	21	21	10	10	31	31
Negative	39	39	30	30	69	69
Commitment						
Strong	25	25	20	20	45	45
Weak	35	35	20	20	55	55

Table 1 had shown that respondents mostly have good prior behaviour and good behaviour in fulfilling children's nutrition (35%). Mostly have strong self-motivation and good behavior (36%). Mostly have negatively perceived benefit, but have good behaviour (38%). Mostly perceived no barrier and had good behaviour (33%). Mostly have a weak perceived self-efficacy, but still, have good behaviour (31%). Mostly have negative affect regarding nutritional fulfilment, but have good behaviour (39%). And, mostly have weak commitment, but have good behavior (35%).

Table 2 The Summary of linear regression analysis

Coefficients							
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**	**Note**
B		**Std. Error**	**Beta**				
	(Constant)	4.708	15.980		.295	.769	
	Prior related behaviour	.113	.138	.071	.822	.414	Non significance
	Motivation	.494	.151	.342	3.275	.002	Significance
	Perceived benefit	.302	.171	.155	1.770	.081	Non significance
	Perceived barrier	-1.128	.176	-.775	-6.424	.000	Significance
	Perceived self-efficacy	.318	.104	.266	3.051	.003	Significance
	Activity-related affect	.663	.093	.667	7.134	.000	Significance
	Commitment	.032	.089	.033	.362	.718	Non-significance

Table 2 showed that self-motivation, perceived barrier, perceived self-efficacy, and activity-related affect significantly influence mother's behaviour in nutritional fulfilment of school-aged children. Positive T-value indicates direct influences, whereas negative means indirect.

DISCUSSION

The results showed that most of the respondents had a good prior related behaviour and behaviour in fulfilling the school-aged children nutrition. Prior related behaviour can define as one's habit[10]. According to HPM, prior related behaviour had influenced health promotion behaviour. The benefit which derived from past behaviour mentioned as the expected outcomes. When an individual satisfies with the result of certain behaviour, this behaviour will be repeated in the future[8].

Mother's behaviour in fulfilling school-aged children nutrition was evaluated from the mother's ability to serve nutritious and diverse foods. Most of the school-aged children were eat as mentioned on recommended dietary allowances and food diversity. Their diet was likely fewer vegetables and fruits (only 1-3x/week), but more on rice, fish, eggs, and unhealthy snacks. This is possible because school-aged children already have an appetite and they're more likely to consume snacks[11]. It can also because Bulak Banteng Village was located on the coastal area of Surabaya city[4], so fish were easily available at low prices.

Linear regression analysis had shown that prior related behaviour didn't significantly influence mother's behaviour in fulfilling nutrition for school-aged children. Prior related behaviour stay on the memory of each person, which consider to be accepted or rejected as a present behaviour[12]. So, the prior related behaviour may be indirectly contributing to mother's nutritional behaviour. The others factors also needed to shape one's positive behaviour.

Most of the respondents have a strong self-motivation and a good behaviour to the fulfilment of school-aged children nutrition. Pender's on HPM said that personal factors (biological, psychological, socio-cultural) were one's general characteristics that influence their health behaviour[8]. In this research, the psychological factor which is self-motivation were evaluated regarding its influence on mother's behaviour in the fulfilment of nutrition. Most were motivated to provide nutritious and diverse foods to their children because they believe that this was their responsibility. They want to keep the quality of food prepared. And they didn't feel tired to do that.

Linear regression analysis had shown self-motivation has a significant influence on mother's behaviour in the fulfilment of nutrition. As their self-motivation is stronger, their behaviour will be better. It is similar to the previous research which stated that self-motivation is an essential factor for the successfulness of positive behaviour[13]. It can be concluded that self-motivation can foster the self-willingness to encounter all barrier to bring up the positive behavior.

Both of respondents with positive and negative perceived benefit of nutrition have good behaviour in the fulfilment of school-aged children nutrition. Perceived benefit define as one's understanding of the advantages or benefits that were positively related to health behaviour[8]. Based on questionnaire analysis, it is found that most of the respondents agree, nutritious and diverse food will make their child healthy and immune to the disease, provide energy, and make their body weight stay normal. Most of the respondents with a negatively perceived benefit of nutrition stated that nutritious and diverse food can lead to obesity and unhealthy snacks don't influence children's weight. The result of linear regression analysis also shows that perceived benefit didn't influence the mother's behaviour in the fulfilment of school-aged children. One's will perform a healthy behaviour when they recognise that the benefit of new behaviour is higher than the consequence of continuing their old behaviour.

Most respondents perceived no barrier and had good behaviour in fulfilling their school-aged children nutrition. Perceived barrier is a perception of obstacles to perform current healthy behaviour[12]. By analysing the respondent's answer, it can be concluded that the most impinging barrier was children's appetite. Mostly agree with the negative statement such as children were prefer to eat out, mothers cannot refuse children's want to consume snacks, and children prefer snacks rather than vegetables and fruits. Previous research also found that the barrier to fulfilling nutrition was taste, challenges in getting ingredients, cooking, plating, and less knowledgeable about nutritious and diverse food with low prices[14]. Perceived barrier significantly influence the mother's behaviour in the fulfilment of school-aged children nutrition, based on linear regression analysis. As the mother perceived many barriers, they tend to delay the healthy behaviour.

Perceived self-efficacy is a personal ability to manage and perform certain health behaviours[8]. It is encouraging people to change their behaviour. Most of the respondents in this research have a strongly perceived self-efficacy and good behaviour in the fulfilment of nutrition for school-aged children. Bandura said that self-efficacy is not related to one's skill but refers to self-evaluation about their ability to perform something by considering their skills[15]. In this research, mothers try to emphasise and improve their self-efficacy, so they can compete against all barrier to fulfilling their school-aged children nutrition. Linear regression analysis had shown that perceived self-efficacy has a significant impact on mother's behaviour in the fulfilment of school-aged children nutrition. As perceived self-efficacy goes stronger, behaviour in nutritional fulfilment also increasing.

Most of the respondents have a negative activity-related affect, but still, have good behaviour in the fulfilment of school-aged nutrition. Pender stated that activity-related affects have an impact on one's health-promoting behaviour. Activity-related affect refers to positive or negative feelings on current activity. This feeling will drive an individual to change or maintain their past behaviour[12]. Most of the respondents have a positive activity-related affect by providing fish or meat with rice and vegetables, buying high-quality ingredients, and preparing lunch box to bring to school. But, some of them have a negative activity-related affect which is shown by letting their children consume snack, serving instant or fast foods, and have no limitation on children's intake. Based on linear regression analysis, can be concluded that activity-related affect has a significant influence on mother's behaviour in the fulfilment of school-aged children nutrition. It's similar to the previous research's result which is found that positive feelings can lead to the repetition of behaviour, whereas negative feeling can decrease the possibility to repeat behaviour in the future.

The result had shown that most of the respondents have a weak commitment, but still have good behaviour in the fulfilment of school-aged children nutrition. Pender through HPM said that commitment could be defined as one's desire to engage in particular health behaviour, including strategies identification to perform a positive behavior [8]. Linear regression analysis had found that commitment has no significant impact on mother's behaviour in the fulfilment of school-aged children nutrition. It is similar to the previous research result which is found that commitment does not necessarily end in expected health behaviour if other behaviours were more interesting to do. Another factor such as self-regulation is required for a strong commitment to ending in positive behaviour[14].

CONCLUSIONS

Mother's self-motivation, perceived self-efficacy, and activity-related affect have a significant role in mother's behaviour in fulfilling school-aged children nutrition. Therefore, efforts can be made to reduce the incidence of malnutrition in school-age children by improving mother's self-motivation, perceived self-efficacy, and affect. So that, school-age children can be met his nutritional needs well.

Nurses should create health promotion which can increase mother's self-motivation, perceived self-efficacy, and affect in fulfilling school-aged children nutrition. For example, how to make nutritious food which is cheap, how to make a healthy snack to reduce street food snacking on children, and the danger of an unhealthy snack. Further research should examine the other factors on the health promotion model, such as interpersonal and situational factor to complete this research finding.

Ethical Clearance: This research has passed the ethical test conducted at the Ethics Committee of the Faculty of Nursing, Universitas Airlangga number 412-KEPK.

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Spatial Variation of Human Cancer Incidence across Babylon State in (2010)

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ABSTRACT

Cancer is an abnormal growth of the cells of the body, and may move from one place to another and lead to the growth and proliferation of irregular cells to form tumors are on the two types of tumor and benign tumor malignant, and there is no specific reason for the emergence of tumors and factors Environmental, genetic, economic, social, dietary habits such as smoking, drinking alcohol and drugs. The research aims to study cancer in the province of Babylon, one of the Iraqi provinces, the results showed a clear spatial disparity between the administrative units of the province, the rate of cases of cancer in all the province of Babylon in 2010 (43) Of the population, which is more than the rate of cases of infection across Iraq, amounting to (38) injuries per 100 thousand people. The study also showed a difference in the rates of infection according to the ten common types of cancer in Babil province comes on the list of these types is breast cancer, where the rate of infection (9.35) per 100000 population, which is one of the most dangerous types of cancer threat to the population, especially females. Lung cancer and bronchitis come in second place with a rate of (8.45) infections per 100000 population. Then leukemia comes in third place (5.47) per 100000 population. Pancreatic, gastric, and laryngeal cancers are among the lowest-risk cancers for the above-mentioned species (1.97-1.86-1.69), respectively. The level of administrative units, Hala recorded the highest rate of cases infected with the disease (56.18) per 100000 population. Followed by Musayyib (43.51), Mahawil (31.89), and Al-Hashimiah (27. 80).

***Keywords**: Cancer, Genetics, Environment, Spatial Variation*

INTRODUCTION

Cancer is the most important cause of mortality in the world. Breast cancer is the second most common cause of cancer death in women. Many cancers initially respond to chemotherapy, but later develop resistance (1)regional, and national health policies. In the Global Burden of Disease Study 2013 (GBD 2013. Represents most cancers some of the essential challenges cutting-edge then after challenges dealing with researchers every over the world, health institutions, partial or global into typical and the Iraqi presidency among particular, along with the increasing fall of annual disease. Given the respect regarding this topic has gone according to the middle on the discipline of most cancers of the kingdom about Babylon and in accordance with articulate the trade about its spatial decoding is a primary purpose of the country (2)the technology and capabilities of CT scanners have changed tremendously (helical and spiral CT are equivalent technologies; for consistency, the term "helical" will be used throughout.

The boundaries of the sea of the region regarding Babylon who is certain over the governorates on Iraq, located graceful of the headquarters (Baghdad) road, bordered with the aid of regarding upper about Baghdad and just northern of the western Anbar state or in conformity with the west the state of Karbala then in accordance with the Antarctic the provinces on Najaf, Qadisiyah or after the East the county on Waist. It is that willpower concerning the spatial certain about the provinces concerning the Middle Euphrates, as into the

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chart (3). Located among latitudes (32° -15 33°) north or longitudes (44°- 15 45°) in imitation of the past about the figure (1) yet a bourgeois (5119 km2) region consists of the education 16-node administration at the level concerning the arm the centers consume the 12 of hand (4)to describe any adaptations required to this test system for the abovementioned purpose, and to use this test to record any changes in outcome over time.\\n\\nDESIGN: A structured approach to the Action Research Arm Test was adopted including interrater and intrarater reliability assessment at the very beginning of its use and ongoing comprehensive monitoring of patients through regular checkups. Four male patients who had undergone hand or forearm allotransplantations, in the authors' center, were examined. All 19 items in the Action Research Arm Test were reviewed, and the total score was calculated, taking into account the given time limits for each item.\\n\\nRESULTS: All patients showed a marked clinical improvement in their test results over time. They continued to have difficulties with performing items in the pinch subtest. The intrarater and interrater assessment achieved consistent results.\\n\\nCONCLUSIONS: The data of this study indicate that the Action Research Arm Test is suitable for assessing the level of upper extremity function. The test can be used to compare functional outcomes after hand and forearm allotransplantation between different centers, providing objective information concerning the quality of reconstruction.", "author":[{"dropping-particle":"","family":"Ninković","given":"Marina","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Weissenbacher","given":"Annemarie","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Pratschke","given":"Johann","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Schneeberger","given":"Stefan","non-dropping-particle":"","parse-names":false,"suffix":""}],"container-title":"American Journal of Physical Medicine and Rehabilitation","id":"ITEM-1","issued":{"date-parts":[["2015"]]},"title":"Assessing the outcome of hand and forearm allotransplantation using the action research arm test","type":"article-journal"},"uris":["http://www.mendeley.com/documents/?uuid=b80fbd45-8dab-42a8-ae62-7391e7b38b8a","http://www.mendeley.com/documents/?uuid=e36fe7a8-017d-4ab2-9a85-f416c6157613"]}],"mendeley":{"formattedCitation":"(4.

Figure.1 Map of Babylon Governorate (3)

Figure..2 Administrative divisions of Babil Governorate Map (3)

Cancer can be defined as a disease in which a group of abnormal cells grow uncontrollably by disregarding the normal rules of cell division. Normal cells are constantly subject to signals that dictate whether the cell should divide differentiate into another cell or die (5). Cancer cells develop a degree of autonomy to continue and spread it can be fat. In fact, almost 90% of cancer-related deaths are due to tumor spreading –a process called metastasis. Now define cancers a disease that involves change or mutations in the cell genome .these change (DNA mutations) produce proteins that disrupt the delicate cellular balance between cell division and quiescence, resulting in cells that keep dividing to form cancers one. The second – largest common disease cause

the death in the world is cancer – malignant tumors (6) and their morphology is governed by the delicate balance between frequent fusion and fission events, as well as by interactions with the cytoskeleton. Alterations in mitochondrial morphology are associated with changes in metabolism, cell development and cell death, whilst several human pathologies have been associated with perturbations in the cellular machinery that coordinate these processes. Mitochondrial fission also contributes to ensuring the proper distribution of mitochondria in response to the energetic requirements of the cell. The master mediator of fission is Dynamin related protein 1 (Drp1.

Other causes in the increase of cancer diseases in the Musayyib district is the missile strikes by the occupation forces in the first Gulf War and the second addition to the large number of former military manufacturing sites and their remnants and the rest of them currently in the region as a source of danger and impact on human health due to the nature of materials used in the manufacture of weapons and ammunition (7), and the non-compliance of these institutions with the rules of health safety of former employees and neglect of the health authorities of these sites and now isolate them from the population and prevent them from approaching (26), which caused a significant increase in the number of cases of cancer. Mahaweel is ranked third in the number of casualties (31.89) per 100000 inhabitants (8)its dynamic patterns have not been analysed at the genome scale in human pre-implantation embryos due to technical difficulties and the scarcity of required materials. Here we systematically profile the methylome of human early embryos from the zygotic stage through to post-implantation by reduced representation bisulphite sequencing and whole-genome bisulphite sequencing. We show that the major wave of genome-wide demethylation is complete at the 2-cell stage, contrary to previous observations in mice. Moreover, the demethylation of the paternal genome is much faster than that of the maternal genome, and by the end of the zygotic stage the genome-wide methylation level in male pronuclei is already lower than that in female pronuclei. The inverse correlation between promoter methylation and gene expression gradually strengthens during early embryonic development, reaching its peak at the post-implantation stage. Furthermore, we show that active genes, with the trimethylation of histone H3 at lysine 4 (H3K4me3, The lowest rate of infection (27, 80) per 100000 inhabitants was recorded in Al Hashimi district because the two cases are characterized by the agricultural nature of the arable land and the economy in general on agriculture, which means the reduction of the proportion of manufacturing and the resulting environmental pollutants compared to what is in the areas of Hala and Musayyib (9).

MATERIAL AND METHOD

Spatial variation of cancer at the level of Babil province

The degree of cancer is different not only globally but also at the level Regional and local levels where the factors of the geographical environment share the variation in infection at previous levels. Data from Table 1. shown the calculated rate of infection per 100000 population. There is a difference in the incidence of cancer at the level of the administrative units of Babil state in 2010, (56, 18) per 100000 population (9). This is due to the large size of the judiciary as well as the fact that the city's environment has high levels of pollution. The industrial district, which includes most of the establishment's industries such as construction industries, a chemical, textile, and soft drinks (10)"ISBN":"0165-9936","ISSN":"18793142","abstract":"Two of the main topics of growing concern in analytical chemistry are the development of green analytical methods and the determination of emerging pollutants. One of the well-established green extraction techniques is microwave-assisted extraction (MAE. In addition, factories produce hundreds of tons of solid waste, as well as large amounts of polluting gases such as CO2, H2SO4, and CO. (cadmium, cobalt, chromium, lead, manganese, nickel, sulfide). Some studies conducted in the al-Hela river indicate that cadmium ranged from 1.9-2.58 μg/g this amount is close to the high global concentrations (11) terrestrial ecosystems hold the potential to capture and store substantially increased volumes of C in soil organic matter (SOM.

Table. 1 Geographical distribution of the rate of cases of cancer in Babil province in 2010

Administrative unit	Infection rate per 100000 population
Spend the solution	56‹18
Mahaweel district	31‹89
Hashemite district	27‹80
Musayyib district	43‹51
Total Governorate	43‹00

Role of genetic

Many studies have been conducted to determine changes in gene expression of DNA polymerases in human cancer (12).

Role of environment

The development of cancer in a species is influenced by a wide variety of changes in the internal and external environments of the host. The aspects of the internal environment that have been studied most thoroughly are hormonal status and nutrition. Hormonal imbalance in mice leads to the appearance of at least five types of tumors in tissues especially dependent on hormonal secretions in their physiology. Hormonal and nutritional also are associated with some tumors in humans. Iodine deficiency may be a factor in the genesis of thyroid cancer. Deficiency development of pharyngeal cancer (13)we conducted a genome-scale analysis of 276 samples, analysing exome sequence, DNA copy number, promoter methylation and messenger RNA and microRNA expression. A subset of these samples (97.

Spread of cancer

One of the biggest problems with cancer is its spread in different parts of the body .This spread through any or all of the three following routes. Any other disease, in cancer also, both the environmental as well as the genetic factors, played in the causation of the disease. Over the last few decades, it has been found the environment plays a prominent role in the causation of most cancer 80 to 90 per cent of all cancers are said to be dependent directly or indirectly on environmental factors (14).

Chemical and physical carcinogens

Induced neoplasms are tumors that can be evoked at will in human exposed to chemical and physical **substances. Some of the environmental agents that have been related to cancer in humans are listed in table (2)**

Chemical and physical carcinogens

Induced neoplasms are tumors that can be evoked at will in human exposed to chemical and physical substances. Some of the environmental agents that have been related to cancer in humans are listed in table (2)

Table 2: Environmental agents related to cancer in man

Site	Agent
Liver	Aflatoxin
Marrow	Alkylating agents
Urinary bladder	Aromatic amines
Skin, lung	Arsenic
Lung , serosa	Asbestos
Marrow	Benzene
Urinary bladder	Benzidine
Lung	Chloromethyl ether
Lung	Chromium
Uterus ,Vagina	Estrogens
Lymphatic	Immunosuppressants
Nasal sinus	Isopropyl oil
Lung	Mustard gas
Skin	Radiation, ultraviolet
Lymphatic	Viruses

Some factors can also cause cancer, changes in life – style including drinking alcohol, smoking and working under the sun and the sun itself cause the cancer (15)

RESULT AND DISCUSSION

The results of laboratory tests of water from the Hilla textile factory and soft drinks showed an increase in the values of (Cl So4-T.D.S.T.H) and high concentrations of phosphates, all of which are outside the permissible limit of 4.1 milligrams per liter in the al-Hala water due to industrial waste and wastewater. The existence of large agricultural areas on both sides of the river, which use many types of fertilizers containing phosphate compounds, and contains the elimination of gas station to generate electricity.

Treatment of cancer

Newer approaches in cancer treatment:

1. Gene therapy.
2. Cancer immunotherapy.
3. Focused ultrasound.
4. RNA inhibition.
5. Charged particle therapy.
6. Robotic surgery.
7. Nanotechnology

Spatial variation of cancer cases in Babil province

Table (3) shows the increase in the number of people suffering from cancer diseases in Babil governorate. The number of infected cases in 2003 was 449 cases and the number increased to 1045 in 2005, an increase of 596 cases. The number has been increasing at a high rate of (1162) cases in 2011, an increase of (713) cases compared to 2003, which is about double the number.

Table. 3 Number of cases of cancer diseases in Babil state in the years (2003-2011)

Years	Number of injured
2003	449
2004	775
2005	1045
2006	1064
2007	922
2008	1007
2009	1098
2010	1095
2011	1162

Comparison of infection rates in the province with the total rates of infection in Iraq, we find that the rate of cancer calculated for each (100000 population) of the population in general babil province for 2010 adjusted to (43) injuries per (100000 population) of the population and more than the rate of infection of all of Iraq, (100000 population) of the total population of Iraq. The rates of infection vary according to the ten common types of cancer in the province of Babylon, as shown in Table (4) and that breast cancer is at the top of the list of cancer in the study area where the rate of infection (9.35) injuries per (100000 population). Breast cancer is one of the most common cancers in the world, and its causes are genetic factors. Some studies suggest that breast cancer patients may have a previous history of the sease in this family. On the other hand, Fat, grease, dairy products, and cancer.

The incidence of lung cancer and airway in the second place with an injury rate of (8.45) per 100000 population of the population. This is due to the rise of urban, where the majority of the population in the cities of the center of the province and the rest of the districts and districts do not move far from the center of the province and take a lot, it was observed that air pollution, especially with car exhaust, is especially important after ascertaining the presence of carbon atoms in patients' ulcer during cellular microscopy. Smoking also causes cancer tumors and increases their complications. The performer to death. Leukemia was the third most common type of cancer (5.47). While the lowest incidence was pancreatic, stomach, and laryngeal (1.97-1.86 – 1.69) per 100000 population of each population, respectively.

Table. 4 The commonest ten cancers in Babil number of new cases primary site, percentage of total / 100000 population

primary site	No .of cases	Registered cases /10^5 pop
Preast	166	9.35
Pronchus& lung	150	8.45
Leukemia	97	5.47
Bladder	79	4.45
Non- Hodgkin lymphoma	61	3.44
Brain & other CNS	60	3.38
Colorectal	52	2.93
Pancreas	35	1.97
Stomach	33	1.86
Larynx	30	1.69
Total ten	763	43.00

CONCLUSION

Normal cells are constantly subject to signals that dictate whether the cell should divide differentiate into another cell or die. Cancer cells develop a degree of autonomy to continue and spread it can be fat. In fact, almost 90% of cancer- related deaths are due to tumor spreading –a process called metastasis. The research aims to study cancer in the province of Babylon, one of the Iraqi provinces, the results showed a clear spatial disparity between the administrative units of the province, the rate of cases of cancer in all the province of Babylon in 2010. The level of administrative units, Hala recorded the highest rate of cases infected with the disease. Followed by Musayyib, Mahawil, and Al-Hashimiah. Cancer- related deaths are due to tumor spreading –a process called metastasis. Now define cancers a disease that involves change or mutations in the cell genome. These change (DNA mutations) produce proteins that disrupt the delicate cellular balance between cell division and quiescence, resulting in cells that keep dividing to form cancers one.

Ethical Clearance: People identified as potential research participants because of their status as relatives or carers of patient's research participants by virtue of their professional role in the university and departments.

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Characteristics of Overweighed and Obese Adults attended Nutritional Clinic in Al-Qadisiyah Governorate, Iraq, 2014

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ABSTRACT

Overall world, the community is undergoing a rapid epidemiological and nutritional transition characterized by persistent nutritional deficiencies or increasing overweight and obesity rate which is one of important challenge that needs to change in food habit and lifestyle toward healthy diet and regular physical exercise. In Iraq, this problem is not fixed, but according to Stepwise Surveillance of Chronic NCD Risk Factor 2006 the overweight and obesity rate was 67%(34.8%fe male, 32.1% female). This study aimed to estimate the describe BMI status and characteristics factor that associated with overweight and obesity.

A file base descriptive cross-sectional study was conducted in 2016. files of adults aged >18 years attended the Nutritional clinic during 2014 were reviewed. demographics characteristics and BMI status were considered and presented as a percentage. mean of age was computed and some variables were crosstab with BMI classification recommended by WHO. statistical significant considered when p-value ≤ 0.05.

A total study sample was 722, Male to female ratio was 1:6, the mean of age was 32.8 ± 9.9. About 20.5% was normal BMI while the overweight and obesity was 79.5%. The study showed that the overweight and obesity rate was higher in female than male(88.2 % vs 21.8%, p-value > 0.001).it is also higher in married status than single(81.7% vs 18.3%, p > 0.001). The basic educational level had high overweight and obesity rate which was 46.1% with the statistically significant association (p-value = 0.05). We conclude that the overweight and obesity rate was high among female, married and persons have a basic educational level in the Iraqi community.

Keywords: *Overweight, BMI, Obesity, Nutrition.*

INTRODUCTION

Obesity is a disease in which excess fat has accumulated in the body that health may be negatively affected[(1)]The World Health Organization (WHO) recognizes obesity as a global health issue with one billion adults worldwide identified as overweight and an additional 300 million obese [(2)]. it has affected developed and developing countries [(3)] a lot of studies were found that a combination of excessive calorie intake and a sedentary lifestyle are the main causes of obesity and overweight [(4)]. This considered as a global health problem and is steadily affecting many of countries, particularly in the urban area. The obesity prevalence has increased at an alarming rate [(5).] Many countries of low- and middle-income are now facing a "double burden" of disease: as infectious diseases and under-nutrition; at the same time they are experiencing a rapid increase in risk factors of NCDs such as obesity and overweight, particularly in urban settings [(6)]. The reasons behind this "epidemic" could be attributed, on the one hand, to modern lifestyles demonstrated by consumption of a diet rich in fatty foods and energy-dense foods, snacking and declining overall levels of physical activity [(7,8)]. On the other hand, familial and genetic predisposition, psychological factors,

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diseases (hypothyroidism, Cushing syndrome) and drugs (steroids, tricyclic antidepressants, sulfonylureas, valproate, and contraceptives) may play a role in the etiology of obesity [7]. Overweight and obesity are known risk factors for diabetes, coronary heart disease, stroke, hypertension, gallbladder disease, osteoarthritis, sleep apnoea, some forms of cancer and infertility. Obesity is also associated with hyperlipidemia, pregnancy complications, hirsutism, stress incontinence, and increased surgical risk[7] .

In Iraq, this problem is not fixed, and the data on overweight and obesity in Iraq is anecdotal, scarce and not representative of the community [9]. but according to Stepwise Surveillance of Chronic NCD Risk Factor 2006 the overweight and obesity rate was 67% (34.8%fe male, 32.1% female). so the aim of our study is to estimate the describe BMI status and characteristics factor that associated with overweight and obesity among the studied sample.

PATIENT AND METHOD

A file base descriptive cross-sectional study was conducted in Aldewaniyh city-south of Iraq during 2016. files of 722 adults aged more than 18 years who attended the Nutritional clinic during 2014 were reviewed. the study included all adult of more than 18 years and excluded anyone with the acute or chronic disease associated with or related to nutritional or metabolic disorder and any pregnant women. Demographics characteristics and BMI status were considered and presented as number and percentage. mean of age was computed and some variables were crosstab with BMI classification recommended by WHO. data analysis was carried out by using SPSS software (SPSS version 18. 0) The suitable statistical test was used for testing the significance of the association between variable under study. Statistical significance will be considered when the P-value was equal or less than 0.05.

RESULT

A total study sample was 722, the mean of age all sample was 32.8 ± 9.94 yr(26.34 ± 6.358 yr for the normal person while 34.48 ± 10.018yr for the obese and overweight person) with the significant association of mean age. As shown in table 1.

Table 1: Mean ± SD of age for the study sample.

	Nutrition status	N	Mean	Std. Deviation	P value
age	normal	148	26.34	6.358	0.001
	Obesity and overweight	574	34.48	10.018	
	total	722	32.82	9.940	0.001

Our study was found that about 79.5% (574 persons) of the study sample was overweight and obesity while normal BMI was 20.5% (148 persons).

The study showed that the male to female ratio was 1:6, female represented 85% of the study sample while the male was 15%. the overweight and obesity rate was higher in female than male(88.2 % vs. 11.8%) with significant association(p-value > 0.001). as in table 2.

Table 2: Distribution of nutritional status according to the gender of the study sample.

		Nutrition status						
	normal		Overweight and obesity		Total		P value	
	N	%	N	%	N	%		
gender	male	40	27	68	11.8	108	15	0.0001
	female	108	73	506	88.2	614	85	
	total	148	100	574	100	722	100	

Also, the study found that overweight and obesity rate was higher in married status than single(81.7% vs. 18.3%) with a significant association between them (p > 0.001) as shown in table 3.

Table 3: Distribution of nutritional status according to the Marital status of the study sample.

		Nutrition status						
	normal		**Overweight and obesity**		**Total**		**P value**	
	N	%	N	%	N	%		
Marital status	single	81	54.7	105	18.3	186	25.8	0.0001
	married	67	45.3	469	81.7	536	74.2	
	total	148	100	574	100	722	100	

The basic educational level had high overweight and obesity rate which was 46.1% with the statistically significant association (p-value = 0.05)as in table 4.

Table 4: Distribution of nutritional status according to the Education level of the study sample.

		Nutrition status						
	normal		**Overweight and obesity**		**Total**		**P value**	
	N	%	N	%	N	%		
Education level	illiteracy	30	20.3	118	20.6	148	20.5	0.05
	basic	54	36.5	265	46.1	319	44.2	
	higher	64	43.2	191	33.3	255	35.3	
	total	148	100	574	100	722	100	

finally, our study showed that the overweight and obesity rate was higher in not working person than in working one (62.7% vs. 37.3%) with no statistically significant association between them(p-value = 0.5) as in table 5

Table 5: Distribution of nutritional status according to the occupation of the study sample.

		Nutrition status						
	normal		Overweight and obesity		Total		P value	
	N	%	N	%	N	%		
occupation	working	59	39.9	214	37.3	273	37.8	0.5
	not working	89	60.1	360	62.7	449	62.2	
	total	148	100	574	100	722	100	

DISCUSSION

Obesity and overweight considered as one of the most serious public health problem and challenges of world wild. The prevalence of childhood obesity has been noted in developed and developing countries but its prevalence is more increasing in developing countries. (10)

Our study revealed that more than 3/4 of the sample were female with a mean ± SD of age was 32.8 ± 9.94 yr with statistical significant (p-value < 0.001).the overweight and obesity prevalence was high (79.2%) among study sample which was higher in female than male (88.2% vs. 11.8%) this result in agreement with results of other studies that conducted in Iraq and in

USA countries [11,12] this may explain by most of attended clients to nutrition clinic were females also due to change in believes, culture and lifestyle of Iraqi woman.

The present study found that overweight and obesity rate was higher in married persons than a single person(81.7% vs. 18.3%) with the significant association between them. This result was similar to others study results that carry out in Iraq and Jordan [13,14] the causes behind this result may be due to that after married the persons have more responsibilities(including children caring) and not interested to change their life.

Regarding educational level, persons with basic educational level and less had higher overweight and obesity rate(46.1%) than other types of education level which was inconsistent with the findings of previous study [13], it may be explained that most of the people with low education had less information about healthy diet and risky of obesity.

There was a high overweight and obesity rate among not working person than in working one (62.7% vs. 37.3%) with no statistically significant association between them this result similar to result of another study that conducted in Jordan and USA[13,15] and it may be due to that most not working person was less activity and lack of exercise with low income.

CONCLUSION

The overweight and obesity prevalence was high among the population of AL-Qadisia city especially among female, married persons have a basic educational level.

Conflicts of Interest: There is no conflicts of interest.

Source of Funding- Self

Ethical Clearance: The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/ have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity.

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Floating Prostitution and the Potential Risk of HIV Transmission in a Religious Society in Indonesia

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ABSTRACT

Background: Indonesia known as the most populous Moslem country in the world, where Padang Municipality, the capital city of West Sumatera Province is recognized as one of the most religious societies in the country. The law strictly prohibits prostitution and adultery, which is supported by all religious communities. However, the Province HIV/AIDS Prevention Commission recorded that there has been a substantial number of femle sex workers (FSWs) in the city. At the same time, the number of HIV/AIDS cases also significantly increased. This study aims to explore existence of prostitution practice and the risk of HIV transmission.

Method: A qualitative study has been conducted to answer the research question by interviewing 31 women sex workers using grounded theory approach and as well as two health workers and three HIV/AIDS prevention commissioners. The data was analyzed using thematic framework analysis.

Result: The poverty is the main reason of FSWs falling into prostitution practice, adding by lack social support from their family and relatives, weak personality and environment influence. Majority of them (58,1%) have low level of education and little knowledge of HIV/AIDS, in which they perceive that they are safe from getting infected when they see the client is physically healthy. Additionally, due to their economic dependant on their sexual transaction, they have low bargaining power to their clients, which leads to unprotected sex.

Conclusion: Economic factor and lack of social control contribute to prostitution practice in Padang Municipality. The sexual contact is mostly unprotected, which becomes a potential risk of HIV transmission.

Keywords: *Prostitution, poverty, HIV/AIDS*

BACKGROUND

Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome (HIV/AIDS*)* has become a global health problem. *United Nations Programme on* HIV/AIDS (UNAIDS) reported that up to the end of 2015 36.7 million people infected HIV, and 3.3% among of them died due to AIDS. The cases have also increased in Asia Pacific within the last decade, which was about 5.1 million people infected HIV, and 300.000 of them were the new cases.[1] The HIV/AIDS has also threated Indonesia, where the cases has increased over the years. Ministry of Health of Indonesia reported that accumulative cases up to early 2016 were 191.073 of HIV and 77.940 AIDS, which significantly increased since 2014.[2]

Province of West Sumatera also faces HIV/AIDS epidemic especially in the capital city, Padang Municipality. Despite well-known as a religious society, the cases founded also increased in the last five years.

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Department of Health of West Sumatera Province reported that the case rate of HIV/AIDS in the province was 24.04/100.000 inhabitants in 2015. The rate is even higher than the national average (19.1/100.000 inhabitants), and placed the Province of West Sumatera in rank 8th nationally.[3] Among all districts and municipalities in the province, Padang has the highest number of the cases. Department of Health of West Sumatera Province reported that the cases rate was 56.96/100.000 inhabitants in the city, which was higher than the provincial and national rates, and estimated that nearly 600 cases of HIV/AIDS cases in the city.[3]

There are high risk population groups, which the prevalence of HIV/AIDS is higher in those population, such as injected drug users, female sex workers (FSWS), and man ho have sex with man (MSM). The prevalence of HIV positive has been found constantly 5% or more in these high-risk population group since 2015. Indonesian Commission of HIV/AIDS prevention also reported that that HIV cases distributed predominantly among those groups, namely 10.4% direct FSWs, 4.6% indirect FSWS, 24.4% transgender, 0.8%-FSWS client, 5.2% MSM, and 52.4% drug users.[4] In Padang Municipality especially, despite it is illegal and forbidden by all ethnic and religious societies, there are hidden or floating prostitution practice in the city.[5,6] Floating prostitution is even worse in spreading of HIV/AIDS because health promotion program cannot reach those community. This study aims to explore the floating prostitution practice in the city and the potential risk of HIV transmission.

METHOD

The study used a qualitative inquiry to address the research objectives by using population case study approach. The participants of the study were 31 women sex workers, which were obtained by snowball principle from the informants, and as well as three commissioners of HI/AIDS prevention of West Sumatera Province and two health workers.

The data was gathered by conducting semi structural interview with the informants, and it is analyzed thematically using behavioral and social relation theories, and later presented narratively.

RESULT

Overview of FSWs

The age of FSWS in Padang range between 20 and 56 years, which majority of them (54.9%) more than 35 years old, and more than half (58.1%) have low level of education. Interestingly, in the marital status, most of them are widow (74.2%). See table 1.

Table 1. Characteristic of female sex workers in Padang

Variable		f	%
Age (years)	< 25	4	12,9
	25-30	6	19,4
	31-35	4	12,9
	36-40	6	19,4
	>40	11	35,5
Level of education	Low (up to grade 9th)	18	58,1
	High School	11	35,5
	University Level	2	6,5
Marital status	Single	1	3,2
	Married	7	22,6
	Widow	23	74,2
Ethnic	Minangkabau	25	80,6
	Java	2	6,5
	Acehnese	1	3,2
	Malay	3	9,7
Starting age as sex workers (yo)	<20	3	9,7
	20-30	15	48,4
	>30	13	41,9
Length as sex workers (year)	≤ 1	8	25,8
	> 1-5	11	35,5
	> 5	12	38,7

Poverty

The sex workers have various reasons fall into prostitution practice, including poverty, environment influence and family displaced. However, most of them blame that their economic condition influences their decision working as sex workers. As mentioned by the informants:

"My reason is… forcing by condition. Ya, I have a husband, but the income is not enough" [R3].

"…for living, I am a single mother, to fulfill my basic need and my four children" [R5].

"I work like this because of economic need. My husband unemployed, then I work like this, he doesn't know" [R15].

"I am divorced with my husband. I don't have income, I don't have money but I have to take care my children so I do this" [R31].

Life style

Some of them fell enjoy for what they are doing, who has been as sex workers for more than 10 years. For this woman, she perceives that sexual transaction is as easy way to earn much money, to provide a high-profile life style, such as having expensive gadgets and luxurious holiday. As mentioned by informant:

"*Honestly, yes, I do this because my family is poor, but I want to have what people have…*" [R18].

"*…I don't 'know… ya.. I want to out from this job, but not now. Now… just enjoy it, I am fine…"* [R21].

Personality

Weak personality and lack of family atention added the economic reasons, which make them easily influenced by the friends and the environtment. Some of them used to works as shop keepers or helper in beauty salon, but they earned small amount of money. When they saw a friend work as a sex worker earned much money and had a luxurious life style make them tempted to do the same. As in mentioned by informant:

"Iniatially… I worked as a helper in beauty salon, I didn't know the sexual job.. I didn't know the job like this, I just knew hair cut and creambath, but… yeah I saw 'plus service' what other do… you know, sex. Then…. Finally, I also do the same" [R18].

"I divorced… stress, I used to have much money from my husband. Then, I worked in beauty salon… initially, I just do hair cut and little massage, but at the end… you know I do 'this' sex" [R21].

"*Initially I only did real salon, then, follow the stream… just like that"* [R23].

Lack of internalizing of religious values

From the religious perspectives, all sex workers believe in the God and having a religion. They perceive that the prostitution is very forbidden and a sin. However, they have to work as sex workers to fulfill ther economic need.

"I am Moslem, I know this is a sin, but I don't know what to do, this is my life no, otherwise I don't have a food. If I have another job, I quit" [R1].

"*I am Moslem… this is a sin, but due to my condition, so I don't know, but in 'selling a sex' I have a boundary…"* [R16].

They perceive that earning money is far more important for them and their family. They see that working as a sex worker is an easy way to do, as mentiond by informant:

"My religion is Islam, I know this is forbidden, it says 'haram' (strickly forbidden), but only by doing this I can earn money for my children. If I work in another place, I know I can only earn very small amount" [R25].

"I am a Moslem, in my religion this is very forbidden, I don't have a job…, this is the only way that I can do to earn money" [R21].

Risk of HIV transmission

Risk of HIV transmission are related to their knowledge, attitude sexual practice. In this study we found that most sex workers having low level of knowledge and lack understanding of risk of HIV/AIDS. Most of them perceive that don't have to worry about HIV/AIDS if they do not feel any symptoms. They also believe that the clients are perfectly healthy if they do not see any signs of any diseases in their body or genital organs. As mentioned by informant:

"*HIV/AIDS as many people say, bad smell, itchy, that's I see when people got the disease. I am not sure, coz I never get it"* [R15].

"I never do a checkup, but I know my body, I don't have any kind of symptom" [R16].

Lack of knowledge of HIV/AIDS risk is added by their economic dependant on the sexual transaction. Most of FSWS cannot force or persuade their clients to have a condom because they feel it may create unpleasant

situation and even insulting them. They fear that they may loss the client, which means loss of income. Out of 31 FSWS, only 12,9% of them use condom consistently, and even 29% of them explained that they never use (table 2). Most of them said they have done HIV test (77%), and willing to do so. However, they never do check up voluntarily. They have done a test is only relied on HIV/AIDS outreach program from Commission of HIV/AIDS Prevention of Padang Municipality or West Sumatera Province.

Tabel 2. Sexual Activity of FSWs

Sexual Activity		**f (n=31)**	**%**
Condom Use	Never	9	29,0
	Sometimes	18	58,1
	Always	4	12,9
Sexual Transaction Frequency (Weekly)	< 7	11	35,5
	7-14	12	38,7
	> 14	8	25,8

DISCUSSION

This qualitative study on FSWs in Padang Municipality reveals that the city is not free from prostitution practice despite it is recognized as one of the most religious society in the country. Also, in contrass by public assumption that the FSWs in the area come from outside of West Sumatera Province, the study shows that majority (80.6%) of them are West Sumateran origins of Minangkabau ethnics. This means that the FSWs comes from the inner society. The study indicates that the society norms and values are not apply for their principles. This is supported by our finding that, most of FSWs do not really understanding their religious values and social norm. despite they believe in God and have a religion, they do not practice it. As Roem[6] mentioned that prostitution in the city is really exist. Some of them may used illegal street taxy in night time, which called 'dark taxy'. They use this kind of service to approach client and as well as to escape easyly from city police if any incidental patrol.

Despite living in a society with strong religious norm, this cannot prohibit them to be FSWs, in which they have lack of understanding of their religios and social norm. They have personal justification, with the reasons of poverty and feeling displaced from their family and relatives. As the study found, that most of them are widow, in which they are responsible for economic burden of their family and their children. With low level of education and lack of skills, its is difficult to find proper job for them, then a prostitution is an easy way that they see to earn money. This study also similar to Destriani and Harnani[7] research in Pekanbaru, other city in Indonesia, which explained that most of floating FSWs were women who were failure in their marriage and have low level of education. Rokhmah[8] also mentioned that sexual transaction is an alternative way of women to survive in urban area. Women with low level education and limited job vacancy, may see protitution is an open opportunity, which also relatively give satisfactory income for survive.

Knowledge and understanding of FSWS in Padang are very weak, despite all of them know HIV/AIDS threat. They never do check up voluntarily, and some of them did a test is only relied on HIV/AIDS outreach program from Commission of HIV/AIDS Prevention of Padang Municipality. Lack of understanding of HIV/AIDS, in which they believe that the clients are perfectly healthy if they do not see any signs of any diseases, is also seen by their way in serving their client. Among all of participants, only 12,9% of them use condom consistently, and more than a quarter (29.5%) never use it. More over, floating FSWs has low bargaining position to their client due to economic dependant on the sexual transaction. For them, loss of client means loss of income. As a result, they cannot force or persuade the clients to have protected sex, which lead to risk of HIV transmission. Similar study by Januraga[9] in Bali, that FSWs also compete economically with their peers, which likely to accept unprotected sex from their clients to win the competition and get a customer. The sex workres may know their vulnerability to HIV/AIDS but they cannot ask the clients to use condom due to fear of client rejection and anger.[11] It means that safe and protected sex in prostitution is not only influenced by FSWs knowledge on risk of the diseases but alo by economic and gender relation issues.[10] Health promotion through comprehensive primary health care should be done to address this problem.[12]

CONCLUSION

This study examined that the society with strong religious and social values may not free from prostitution practice, when other social factors, such as poverty and lack of social support make women more vulnerable.

Women who become FSWs too dependent economically on their prostitution practice likely to accept unprotected sex, which become a potential of HIV transmission.

Ethical Clearance: Formal permission was obtained from the Board of Nation and Public Protection of Padang Municipality. Participation of of FSWs were invited voluntary and they were informed that their participation would remain anonymous.

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Conflict of Interests: The authors declare that there is no competing interests.

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The Effect of Training on Efforts to Reduce Maternal Mortality Risk to Behavior of Community-Based Safe Motherhood Promoters (SMPs)

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ABSTRACT

This study aimed to determine the effect of training on efforts to reduce maternal mortality risk to behavior of community-based Safe Motherhood Promoters (SMPs) in Jeneponto District, using "Pretest-Posttest with control Group Design". Data collected through observation and interview to 46 respondents. Data were analyzed by Mann Whitney-U, Wilcoxon, McNemar and Spearman correlation test. The results were: 1) There was no difference in knowledge, attitude and skill between Safe Motherhood Promoters (SMPs) group and control group before the training, 2) There was a difference in knowledge, attitude, and skill between SMPs group and control group after the training, 3) There was difference in knowledge, attitude, and skill of SMPs group between before and after the training, 4) There was no difference in control group knowledge, attitude, and skill between before and after training. It could be concluded that there is an effect of training on reducing maternal mortality risk to knowledge, attitude, and skill of community based SMPs.

Keywords: *Safe Motherhood Promoters, Maternal Mortality Risk, Knowledge, Attitude, Skill*

INTRODUCTION

Maternal Mortality is one of the major global health problems, and generally occurs mainly in developing countries. The global agreement called the Millennium Development Goal (MDGs) in particular the fifth objective aims to reduce three-quarters of Maternal Mortality Rate (MMR) by 2015 - on the basic of 1990[(1)]. Several countries have successfully achieved MMR targets, and some other countries, including Indonesia, despite the decline, the MDGs 2015 target is not reached[(2)].

Indonesian Demographic and Health Surveys (IDHS) in 2012 showed a very poor result of maternal mortality rate increased from 228 / 100.000 live birth in 2007 reached 359 per 100 thousand live births. In South Sulawesi, in 2012 there was an increasing in MMR comparing to the previous three years with the number of maternal deaths of 160 people or 110.26 per 100,000 live births. In2013 again a sharp decline with the number of deaths 115 people or 78.38 per 100,000 live births. It consist of maternal death 15.65%, maternal deaths 51.30% postpartum maternal mortality 33.04%[(3,4)]. In Jeneponto district increased from 2011 to three peoples (46 per 100,000 live births) to 11 people (170 per 100,000 live births) in 2012. Then there was a decrease in 2013 by 5 people (82 per 100,000 live births), and increased in 2014 (13 people of maternal death), while in 2015 = 8 people death[(5)].

A substantial increase in MMR out of estimates, quite a lot of interventions implemented by the Indonesian government. However, it did not produce maximum results as an ideal condition if the community trained to be "Safe Motherhood Promoters (SMPs)". In an effort to reduce the risk of maternal death with the aim, the community can affect mothers and families about risk factors of maternal mortality, services during pregnancy, safe pregnancy and childbirth planning, and postnatal

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care, to reduce maternal mortality.

MATERIALS AND METHOD

This research used "Pretest-Posttest with Control Group Design". The intervention was training by using role-play and counseling skills, as well as reference aids, training manuals, and reporting logging forms[6,7]. Data collection used observation, and interview using questionnaire. The respondents are 46 people of Bululoe PHC. Methods of data analysis using Mann Whitney test and Spearman correlation test.

FINDINGS

This research conducted in the working area of Bululoe PHC Jeneponto district. Based on the results of data analysis, obtained information as follows:

Table 1. Characteristics of Respondents

No	Characteristics	Sample Groups				Total	
		Experiments		Control			
		n=23	100%	n=23	100%	N=46	100%
1	The Origin of the Village						
	Jombe	5	10.9	5	10.9	10	21.7
	Tanjonga	6	13.0	6	13.0	12	26.1
	Mangepong	6	13.0	6	13.0	12	26.1
	Bululoe	6	13.0	6	13.0	12	26.1
2	Age (Year)						
	20-30	8	34.8	8	34.8	16	34.8
	31-40	10	43.5	10	43.5	20	43.5
	41-50	5	21.7	5	21.7	10	21.7
3	Education						
	Elementary School	1	4.3	1	4.3	2	4.3
	Junior High School	8	34.8	8	34.8	16	34.8
	Senior High School	6	26.2	6	26.2	12	26.2
	Diploma II	1	4.3	1	4.3	2	4.3
	Diploma III	4	17.4	4	17.4	8	17.4
	College	3	13.0	3	13.0	6	13.0
4	Work						
	Housewife	16	69.7	16	69.7	32	69.7
	Farmers	1	4.3	1	4.3	2	4.3
	Internships	2	8.7	2	8.7	4	8.7
	Honorary	3	13.0	3	13.0	6	13.0
	Enterpreneur	1	4.3	1	4.3	2	4.3

Table 2. Knowledge, Actitude and Skill before Provision of Training

No	Variable (Pre-Test)	Groups				Total		p value
		Experiments		Control				
		n=23	100%	n=23	100%	N=46	100%	
1	Knowledge							
	Less	16	69.6	18	78.3	34	73.9	0.507
	Enough	7	30.4	5	21.7	12	26.1	
2	Actitude							
	Negative	8	34.8	10	43.5	18	39.1	0.550
	Positive	15	65.2	13	56.5	28	60.9	
3	Skill							
	Not-Good	21	91.3	22	95.7	43	93.5	0.555
	Good	2	8.7	1	4.3	3	6.5	

Mann Whitney-U

Table 3. Knowledge, Actitude and Skill after Provision of Training

No	Variable (Pre Test)	Sample Groups				Total		p value
		Experiments		Control				
		n=23	100%	n=23	100%	N=46	100%	
1	Knowledge							
	Less	0	0	17	73.9	17	37.0	0.000
	Enough	23	100	6	26.1	29	63.0	
2	Actitude							
	Negative	0	0	13	56.5	13	28.3	0.000
	Positive	23	100	10	43.5	33	71.7	
3	Skill							
	Not Good	0	0	23	100	23	50.0	0.000
	Good	23	100	0	0	23	50.0	

Mann Whitney

Table 4. Effect of Training on Changes in Knowledge, Actitude and Skills

No	Variable	Sample Groups						p value
		Experiments			Experiments			
		Mean	Median	Min-Max	Mean	Median	Min-Max	
1	Knowledge	16.3	18	3-21	1	1	(-10)-15	0.000
2	Actitude	43.5	42	5-75	-4.2	-3	(-28)-29	0.000
3	Skill	7.8	8	3-10	0.17	0.0	(-3)-3	0.000

Spearman Correlation

DISCUSSION

Knowledge

The majority of people had less knowledge before the intervention given in the group of SMPs (69.6%) and the control group (78.3%). There were 30.4% SMPs and 21.7% controls have sufficient knowledge, because there are those who go to junior high school, senior high school and college.

There was no difference of knowledge between SMPs group and control group before giving training. After giving intervention, 100% SMPs had enough knowledge, and control group only 26.1%. The knowledge according to Azwar could them aware, know, understand, willing and able to conduct a suggestion that there is a relationship with health[8,9].

There was difference of knowledge between SMPs group and control group after giving training intervention. This stated training transfer knowledge, skills, behavior, and attitude in working on a specific ability[10,11].

The results of this study is available with August's research (2016) that community-based interventions that employ public health workers as teachers in delivering Home Based Life Saving Skills programs to pregnant women and their families increased their knowledge of alarms during pregnancy, labor and postpartum. Preparation for childbirth and increased delivery at health facilities employing skilled health workers in rural communities[12].

There was influence of giving training about effort to decrease maternal mortality risk to knowledge change of Safe Motherhood Promoters. This is in line with the results of research states that increased knowledge and attitude of mothers after gave treatment is the result of providing health education with audiovisual media[13].

According to WHO that the change in health behavior that originated from the provision of information is a form of behavior change through education or health promotion, using Participation Discussion method, which is one good way in order to provide information and Health messages[14].

Attitude

The majority of people had positive attitude before giving of intervention that is on SMPs group (65.2%) and control group (56.5%). The forming factors that occur because of the social interaction experienced by individual, so that individuals interact to form patterns of attitude[9]. This also fit to Aghoja, et al. (2010) statement that for the realization of the attitude in order to become a real action, necessary supporting factors or a condition that allows, among others, facilities[15]. This study reinforced by the theory that states that one's attitude is a very important component in health behavior, which then assumed that there is a direct relationship between attitudes and behavior of a person[9].

There were 34.8% of SMPs and 43.5% of controls with negative attitude. This is due to a lack of knowledge about efforts to reduce the risk of maternal death. Other factors that influence the formation of attitudes include personal experience, culture, others who considered important and the mass media.

There was no difference of attitude between SMPs group and control group before giving training

intervention about effort to decrease maternal mortality risk. After giving intervention, 100% SMPs had a positive attitude, and the control group was only 43.5%. This is because one of the components that make up an important attitude is the cognitive component, because a good attitude occurs after knowledge is also good.

There was difference of attitude between SMPs group and control group after giving training intervention about effort to decrease maternal mortality risk. Referring to the statement attitude cannot separated from the socialization of the family, school or outside school education and knowledge in the community. The role of education cannot ignored, because education done almost for life, either through formal or informal education[16].

There was influence of giving training about effort to decrease maternal mortality risk to change attitude of SMPs. This fit to the results of Okour et al. (2012) on the effect of education on the attitude of pregnant women. She stated that the increase of respondent information has an impact on the improvement of knowledge, where after they understand it they will evaluate their behavior when they feel inappropriate behavior then they will choose better behavior to improve their attitude[17].

Skill

Skill is the result of repetitive exercise, which can called an increasing or progressive change by the person who studies the skill as result of a particular activity[18,19]. In this study, the skill assessment done directly in the simulation. The majority of the community had bad skills before giving intervention in SPMs group (91.3%) and control group (95.7%). Behavior change or adopting new behaviors follows the stages of change: knowledge, attitude, practice[20].

There were 8.7% of SMPs and 4.3% controls with good skill. This is due to good knowledge and positive attitude toward reducing the risk of maternal death. The results fit to the theory of Green (2000), that the knowledge possessed by a person is one of the predisposing factors to facilitate a person to behave and behave specifically[9].

There was no difference of skill between SMPs group and control group before giving training intervention about effort to decrease maternal mortality risk. This aspect, according to Notoatmodjo (2007) if it requires an institutional or sustainable behavior then treated the positive knowledge and belief/attitude about what will done.

After giving 100% intervention, SMPs have good skill, and control group 0%. This result fit to the Green theory[9]. He stated a change in a person's behavior influenced by predisposing factors that facilitated a person or society behave. In this case, the mother's knowledge about efforts to reduce the risk of maternal death. Reinforcing factors are factors that strengthen and support a person or society behaves (in this case is the support provided by the husband, family, community and health workers).

There was a difference of skill between SMPs group and control group after giving training intervention about effort to decrease maternal mortality risk. This is in line with the research of Rifkin (1987) states that a community-based antenatal education program can increase women's chances of adopting health-beneficial behavior in the post-natal period[21].

This study supports the theory of Thaddeus, Maine (1994) that the health behavior of a person or society determined through the intention of the person towards the object of health, the presence or absence of support from the surrounding community. Whether or not information about health, freedom from individuals to take decisions or actions and situations that enable him to behave or not behave[22].

There was influence of giving training about effort to decrease maternal mortality risk to change of skill of SMPs. This is in line with Lankester (2000) that training improves knowledge, and knowledge plays an important role in the determination of attitudes and behaviors[23,24,25]. In line with the results of research which informs that skills improvement after training in intervention groups is higher than In the control group[26,27,28,29,30].

CONCLUSION

The results of this study expect to improve the health condition of mothers. The results of community empowerment in the form of Safe Motherhood Promoters (SMPs) can be a meaningful investment and sustainable. It is a local resident and is less likely to move or stop being SMPs Groups of mothers, husbands, families and communities generally become easier in accessing messages of the mother's health aspects through Safe

Motherhood Promoters (SMPs), while the number of health workers in the village is still relatively limited.

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This research has passed the ethical clearance test in accordance with the applicable regulations in Indonesia.

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Medulloblastoma of the Posterior Fossa in Children: Perioperative Surgical Complications

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ABSTRACT

Objective: detect the preoperative surgical complications in posterior fossa Medulloblastoma in children

Method: A prospective study was conducted from 2003 to 2012 on 35 patients with histopathologically verified Medulloblastoma. Their ages ranged from 3 – 16 years in both sexes, the gender difference found to some extent.

Results: the most common intraoperative complication was hemodynamic instability which seen in 4 patients (11.4%), and haemorrhage (subdural hematoma) which seen in 2 patients (5.7%). The most common postoperative complication was cerebellar dysfunction which seen in 6 patients (17.1%) and cerebellar mutism which seen in 4 patients (11.4%). Surgical mortality was 11.4%. The causes of death distributed between air embolism, brain stem injury and meningitis.

Conclusion: proper and gentle anaesthesia techniques, well trained surgical team, total removal and achievement of proper postoperative care would decrease the morbidity and mortality.

Keywords: *Medulloblastoma, posterior fossa, children, complications, preoperative*

INTRODUCTION

Medulloblastoma (MB) is the most common malignant brain tumour in children. While there are emerging biologic data that help predict prognosis, there are still conflicting conclusions about the effect of many basic clinical factors, such as gender, on the outcome [(1)]. The tumour is almost invariably solid is usually reddishly friable often has a pseudo-capsule. Some tumours are vascular others necrotic. In 15% of cases, there is evidence of recent or old haemorrhage in the tumour [(2-4)].

Clinicopathologic and biologic studies have increasingly supported the hypothesis that Medulloblastoma is a heterogeneous disease with diverse phenotypes and contrasting therapeutic outcomes. Perioperative surgical complications mean all complications that occur intraoperatively and postoperatively which result from anaesthesia technique, patient position, surgical technique and postoperative care [(5)].

Endocranial hypertension & the cerebellar syndrome were the predominant clinical findings in Medulloblastoma [(6)]. Presenting symptoms may be different according to the age of the patient. Older children who can express their symptoms complain of headaches that tend to occur in the early morning & become more frequent & awake them from sleep; an initial headache are usually frontal, but later they are suboccipital, perhaps because of tonsillar herniation. Vomiting is frequent because of increased intracranial pressure (ICP), but also because of direct pressure on the medullary emetic centre, and it is often projectile [(2)].

Intraoperative complications include air embolism, hemodynamic instability, skull perforation with fracture,

spinal cord injury, subdural hematoma, and extradural hematoma [7]. While postoperative complications include persistent unresponsiveness, hematoma, cranial nerve deficits and long tract signs (hemiparesis), cerebellar dysfunction, CSF leak or pseudomeningocele, cerebellar mutism, tension pneumocephalus, infections, seizure, dural sinus infection and thrombosis, and cervical spine deformity following upper cervical laminectomy [8-11].

Overall survival rates after a combination of surgical resection and radiation therapy range from 50-60% at five years and 33-53% at ten years [12]. Total surgical mortality of children treated for posterior fossa Medulloblastoma was 13% [12]. The recurrence rate was 21% of patients with medulloblastoma after four years of follow up. Chemotherapy seemed to contribute to a lower recurrence rate [13].

In the current work, we aimed to detect the preoperative surgical complications in posterior fossa Medulloblastoma in children and to measure the frequency the perioperative surgical complications in posterior fossa Medulloblastoma in children and to correlate the complications with some factors like the extent of a tumour and patient positioning of the patients during surgery.

Patients and method

A prospective study conducted at the Neurosurgical Hospital in Baghdad from 2003 to 2012, written informed written consent obtained from all the participants in the study, and the study and all its procedure were done by the Helsinki Declaration of 1975, as revised in 2000. The study was approved by Neurosurgical Hospital in Baghdad.

It conducted on 35 patients with histopathologically proven to have Medulloblastoma. The patients had different ages, ranging from 3-16 years of both sexes and different geographical regions of Iraq. Clinical data collected; chief complaint and its duration, other symptoms were found including a headache, nausea, vomiting, unsteadiness of gait, and visual impairment, double vision, squint, and gaze abnormality, difficulty in swallowing, disturbed consciousness, and lethargy. The signs found including papilledema, nystagmus, visual acuity, cranial nerves palsy or paresis, cerebellar signs including ataxia, dysmetria, and signs of meningeal irritation. Signs and symptoms were analysed before the shunt operation and after it and after the tumour resection.

We classified the location of a tumour into midline, midline/cerebellar hemisphere or cerebellar hemisphere locations. The density of a tumour either isodense or hyperdense or mixed densities. Cystic changes or necrosis, calcification, the presence of ventriculomegaly either mild dilatation, moderate or markedly dilated ventricle, and the degree of enhancement on contrast C.T scan either homogeneously enhanced tumour, irregularly enhanced, or faint enhancement. The size of the tumour estimated from C.T scans with contrast.

All patients received dexamethasone in a dose of 4 – 8 mg three to four times daily, which was tapered postoperatively. Antibiotic therapy started with induction of anaesthesia third-generation cephalosporin, ampiclox and gentamycin according to the availability of the item. An anticonvulsant used only for few patients having convulsion presentation.

The initial surgery was V.P shunt or direct post. Fossa craniectomy with external drainage or just burr hole ventricular tap. Post. Fossa surgery was done under general anaesthesia in all patients, usually in sitting position (28 patients, 80%) and in the prone position (7 patients, 20%) with Mayfield or Sugita head holder. The tumours were approached either by vermian incision with diathermy and suction in case of midline or midlinehemispheric lesions or cerebellar cortical incision in hemispheric tumours. Tumour resection was usually done by suction and cautery or to less extent by biopsy forceps (piecemeal). The extent of tumour resection always based on the surgeon estimate.

Brain stem violation indicated by bradycardia encountered during the operation, and air embolism detected by resistant hypotension, precordial Doppler used. All patients admitted to the intensive care unit after operation for variable periods.

The postoperative C.T scan done for 21 patients for follow up purposes and because of deterioration in the level of consciousness or persistent CSF leak. Patients followed up for variable periods till they were discharged, died or returned because of late deterioration and some of them followed for six months. Surgical mortality was defined as death within the postoperative period (one month) including the period while the patient was in the hospital. Follow up of survival was difficult after they were discharged from the hospitals,

although some patients came back due to deterioration or symptoms of recurrence.

RESULTS

In this study, it found that the age of the patients ranged from 3-16 years. The peak incidence of the tumour was between 5-11 years of age. Regarding the gender, there were 16 female and 19 males; Shunt operation was conducted before tumour resection in thirty-two patients with Medulloblastoma. All patients showed improvement in their clinical condition following shunt operation except three patients who were not improved postoperatively. Malfunction of the shunt reported in five patients. Shunt infection also reported in 4 patients. All the five patients who developed malfunction were treated successfully by shunt revision. The four patients who developed shunt infection treated by shunt removal as illustrated in table 1.

Table 1: Site of shunt application, CSF pressure and complications

Shunt		Number of patients
Site	Post parietal	23
	Frontal	9
CSF pressure	Severe	27
	Moderate	4
	Mild	1
Complications	Malfunction	5
	Infection	4

Tumour resection and tumour features are illustrated in table 2. Generally, the vascularity of a tumour in Medulloblastoma was high. The intraventricular extension reported in 30 patients (85.7%). Brain stem was violation reported in 18 patients (51.4%).

Table 2: Extents of tumour removal done for the patients enrolled in the study

Tumour removal	Number of patients (%)
Total	17 (48.5%)
Subtotal	15 (42.8%)
Partial	3 (8.5%)

Intraoperative and postoperative complications are illustrated in tables 3 to 5.

Table 3: Intraoperative surgical complications seen in patients enrolled in the study

Intraoperative complications	Patients Number (%)
Air embolism	1 (2.8%)
Hemodynamic instability (bradycardia, arrhythmia)	4 (11.4%)
Skull perforation with fracture	1 (2.8%)
Extradural hematoma (EDH)	1 (2.8%)
Subdural hematoma (SDH)	2 (5.7%)
Spinal cord injury (contusion)	1 (2.8%)

Table 4: Postoperative surgical complications seen in patients enrolled in the study

Postoperative complications		Patients Number (%)
Persistent unresponsiveness		2 (5.7%)
Hematoma		1 (2.8 %)
Cerebellar dysfunction		6 (17.1%)
Cranial nerves deficit		2 (5.7%)
Long tract signs (hemiparesis)		1 (2.8 %)
CSF leak		1 (2.8 %)
Pseudomeningocele		2 (5.7%)
Cerebellar mutism		4 (11.4%)
The absence of a gag reflex		2 (5.7%)
Tension pneumocephalus		1 (2.8 %)
Infection	Wound infection	1 (2.8 %)
	Meningitis	2 (5.7%)
Seizure		1 (2.8 %)

Table 5: Postoperative surgical complications according to the time of occurrences

Immediate (< 6 hr)	Early (< 72 hr)	Late (> 72 hr)
Persistent unresponsiveness Hematoma	Cerebellar dysfunction CSF leak Cranial nerves deficit The absence of a gag reflex Tension pneumocephalus Pseudomeningocele Cerebellar mutism Long tract signs (hemiparesis)	Wound infection Meningitis Seizure

Surgical mortality illustrated in table 6.

Table 6: Surgical mortality among the patients enrolled in the study

Number of the patient (%)	Age (yr)	Cause of death
1 (2.8%)	4	Air embolism
1 (2.8%)	9	The absence of a gag reflex
1 (2.8%)	5	Unknown (postoperative mutism)
1 (2.8%)	4	Post meningitis

DISCUSSION

Medulloblastoma represents one of the main bulk of the posterior fossa tumour in children. As agreed in the literature, Medulloblastoma exhibited a peak of incidence between 5-10 years [4].

Because of its availability and easier application in children, C.T scan was the main diagnostic tool used in this study. It confirmed the universally accepted midline location of Medulloblastoma in 93.3% of cases. It was evident radiologically that Medulloblastoma was solid lesion [2, 14].

Obstructive hydrocephalus demonstrated in all patients with Medulloblastoma which was significantly higher than Karoly et al. [15] report which showed hydrocephalus in 80-90% of posterior fossa tumours. As assessed by C.T, hydrocephalus was more severe in patients with Medulloblastoma, because these tumours showed a high percentage of midline location and solid lesion causing mechanical obstruction of the fourth ventricle outflow. MRI studies in Medulloblastoma, as Larry et al. [16] considered, showed hypointense lesion on T1 W. image and hyperintense lesion on T2 W image.

CSF pressure during the taping of the ventricle, was high in the majority of patients underwent shunt operation (67.1%) indicating the severity of hydrocephalus and late presentation of children. The risk of upward transtentorial herniation and the potential dissemination of malignant tumour cells through the shunt proved in the literature, were not reported in this study.

Malfunctions & infections were the main disadvantages reported in 15.3% & 14% of patients underwent shunt operations respectively. A nearby result was shown by Griwan et al. [17] who observed shunt block & / or infection in 32.8% of patients.

Total removal achieved in 54.2% of patients & the most important parameter that affects the extent of tumour removal was brain stem violation during the surgeon's attempt to remove a tumour from the fourth ventricle floor. These preoperative warning signs occurred in 10% of cases. Furthermore, the high vascularity of a tumour in Medulloblastoma was also adversely affecting the extent of tumour resection. It was strongly evident that total gross removal of a tumour in medulloblastoma will improve prognosis intimately [15].

Postoperative check CT scan was performed for 21 patients, evaluating the extent of tumour removal & searching for postoperative complications. Postoperative CT scan, in agreement with Morreal et al. [18] in which CT scene was more reliable than the surgeon's estimate of the extent of tumour removal during surgery. Among ten patients presumed by the surgeon to get total removal, only two patients showed a residual tumour on postoperative check CT scan, & among seven patients judged to sub-totally removed, surprising one patient showed no residual tumour (small rim of tumour tissue could not be visible on CT scan). So generally, CT scan confirmed surgeon's estimation of tumour removal in 83% of cases. Karoly et al. [15] reported 79% confirmation between the surgeon's judgment of tumour removal & CT scan finding.

The commonest postoperative complication reported in this study, as well as in the literature, was cerebellar dysfunction 6 (17.1%). Pseudemeningocele was directly related to the presence of hydrocephalus postoperatively. It developed in 2 (5.7%) of patients. These patients either not had shunt operation or had malfunctioning shunt. Karoly et al. [15] reported a 7.1% incidence of pseudomeningocele in medulloblastoma patients postoperatively.

Cerebellar mutism was a described complication of posterior fossa surgery, characterised by transient mutism after a brief interval of few days of relatively normal speech postoperatively, which recovered completely in 1-4 months, frequently associated with other neurological manifestations such as long tract signs & neurobehavioral abnormalities. The pathophysiology of this syndrome remains unknown, but is usually seen in big vermian tumour & may be related to the dissection in the region of dentate nucleus. The incidence in the

literature was 16% for patients with medulloblastoma. In this study, cerebellar mutism encountered in 11.4% of patients with medulloblastoma. Midline tumour location, brain stem violation & the use of vermian incision to approach the tumour reported in all children developed this syndrome.

Postoperative meningitis developed in two patients (5.7%). It carried a bad prognosis. One of these patients did not respond to treatment & died. The absence of gag reflex documented in 5.7% of patients. Most of These patients had brainstem violation by the tumour. In spite of patients' recovery in most of these cases, is considered a serious complication as it was the leading cause of death in one patient. Postoperatively, hemiparesis occurred in 2.8 % of patients. Also, such a patient had brain stem invasion & showed variable improvement after physiotherapy.

Mortality rate was (11.4%). Helseth et al.[12] showed a higher mortality rate of children with Medulloblastoma (13%). Lack of antibiotics & inappropriate management of external drain rendered meningitis, the main cause of death in Medulloblastoma.

CONCLUSIONS

The peak incidence of Medulloblastoma was between 5-10 years with gender difference to some extent. Gross total removal of the tumour should be the goal standard of a neurosurgeon, but every effort should be given to avoid brain stem injury. The more solid malignant, midline, vascular and brain stem violated tumours associated with more perioperative complications. The most common intraoperative surgical complications are hemodynamic instability, and haemorrhage (SDH) and the most common postoperative complication are cerebellar dysfunctions and cerebellar mutism. Cerebellar mutism associated with midline Medulloblastoma especially tumours with brain stem invasion. Brain stem violation was the main factor that affects the outcome.

Conflict of Interest : None

Ethical Clearance: Informed written consent obtained from all the participants in the study, and the study and all its procedure were done by the Helsinki Declaration of 1975, as revised in 2000. Neurosurgical Hospital in Baghdad approved the study

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Chemical Synthesis and Characterization of Silver Nanoparticles Induced Biocompatibility for Anticancer Activity

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ABSTRACT

Silver nanoparticles (AgNPs) have gained giant pastime of nanoscience due to the fact of its wide thoroughness over biomedical applications. Current research labor has been discontinued in imitation of look at anticancer endeavor concerning visible SNPs in opposition to ethnic most cancers cell lines. The photosynthesis of SNPs was done the usage of cloud extracts out of Salacia Chinensis (SC) as much a green supply in imitation of limit silver nitrate in imitation of nanoparticles. Nanoparticles are instituted above about quite a number techniques, particularly UV spectroscopy, infrared spectroscopy because of Fourier transform, X-ray diffraction, and scanning electron microscopy. The ultraviolet-visible spectrum regarding the made nanoparticles indicates the maximum peak at 420 nm. The results regarding infrared spectroscopy from Fourier exhibit the arrival regarding alcohols, fragrant compounds, or amines as point out the appearance or stabilization on proteins together with nanoparticles. The analysis on the energetic electron microscope suggests as the spherical silver nanoparticles are spherical along sizes ranging beside 11 according to 27 nm depending over the pH conditions. The effects on X-ray alteration analysis exhibit the emergence concerning silver nanoparticles then theirs lucid nature. The outcomes on it lesson furnish experimental evidence so SC-mixed SNPs be able object as like an anticancer agent and are promising to overcome the boundaries concerning traditional cancer chemotherapy.

Keywords: *Silver nanoparticles; Chemical synthesis; anticancer activity; biocompatibility; Nanotechnology*

INTRODUCTION

Nanotechnology is a more promising location because of generating instant capabilities within biotechnology and nanoscience[1]. Silver nanoparticles (AgNPs) are turning into more and more frequent so antibiotic retailers of textiles, bandages, scientific units or family appliances, such as refrigerators or brimming machines [2]. Among the deep nanoscale products, the close well-known nanoparticle merchandise is nanosilver. AgNPs hold been old because antimicrobials, antioxidants, antioxidants, then anti-inflammatory consequences [3]. Nanotechnology is an altogether pregnant field because of generating new sorts over nanomaterials for biomedical functions [4]. Cancer is certain over a range regarding lethal then various problems along extraordinary organic characteristics induced by means of a sequence about mutations as are thoroughly elect within the predominant jowl then tumour genes. It is defined as the increase concerning cells and odd tissues to that amount are subdivided asleep yet have the potential after infiltrate or wreck the body's herbal tissues. Cancer suggests a

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greater mortality quantity than coronary bravery ailment and strokes [5]. Global demographic yet epidemiological shifts continue in imitation of factor to the growing encumbrance of most cancers over the coming a long time [6]. The affected person left characteristic functionally then psychologically last ensuing among social isolation. In chemotherapy because of cancer, multidrug arrest (MDR) has grown to be an important threat in imitation of people fitness outweigh through negatively affecting the success dimension about treatment. MDR is resisting according to out of danger chemotherapy drugs, as much well as much cross-resistance in conformity with anticancer capsules to that amount hold specific structures then mechanisms [7]. Because concerning the complicated arrest mechanisms concerning cancer, boundaries on biological recreation then toxicity regarding MDR cogitation agents, modern-day chemotherapy marketers failed to associate the ideal requirements because cancer therapy [8]. Thus, to overcome it problem yet fight including near life-threatening illnesses as put down momentous deaths round the world, at that place is a pressing necessity after boost a new and non-invasive therapeutic method after deal with debilitating cancer patients [9].

Nanoscale cancer is certain of the branches of advanced biotechnology then has a solution function between most cancers administration together with advanced standards yet drug methods [10]. Recently, nanoparticles specifically nanoparticles (SNPs / SNP) have been broadly chronic because their drug capabilities among most cancers treatment due to the fact regarding their special physical, physical or chemical properties, easement concerning installation, characterization and floor modification of the nanoscale [11]. Moreover, silver has won a full-size deal about interest between the scientific disciplines because of a vast length over houses certain namely antifungal, antibacterial, antimicrobial, and antiviral [12].

Nanoparticles are constructed using various methods such as much chemical method, fervent decomposition, the electrochemical method, microwave irradiation, laser etching [13]. Although the chemical method is the easiest path in accordance with synthesize silver nanoparticles that is known in conformity with outturn an extensive range regarding dangerous by-products then in the end administration to environmental incompatibility [14]. These defects of the chemical method, name for an instant and environmentally pleasant path according to synthesize nanoparticles [15].

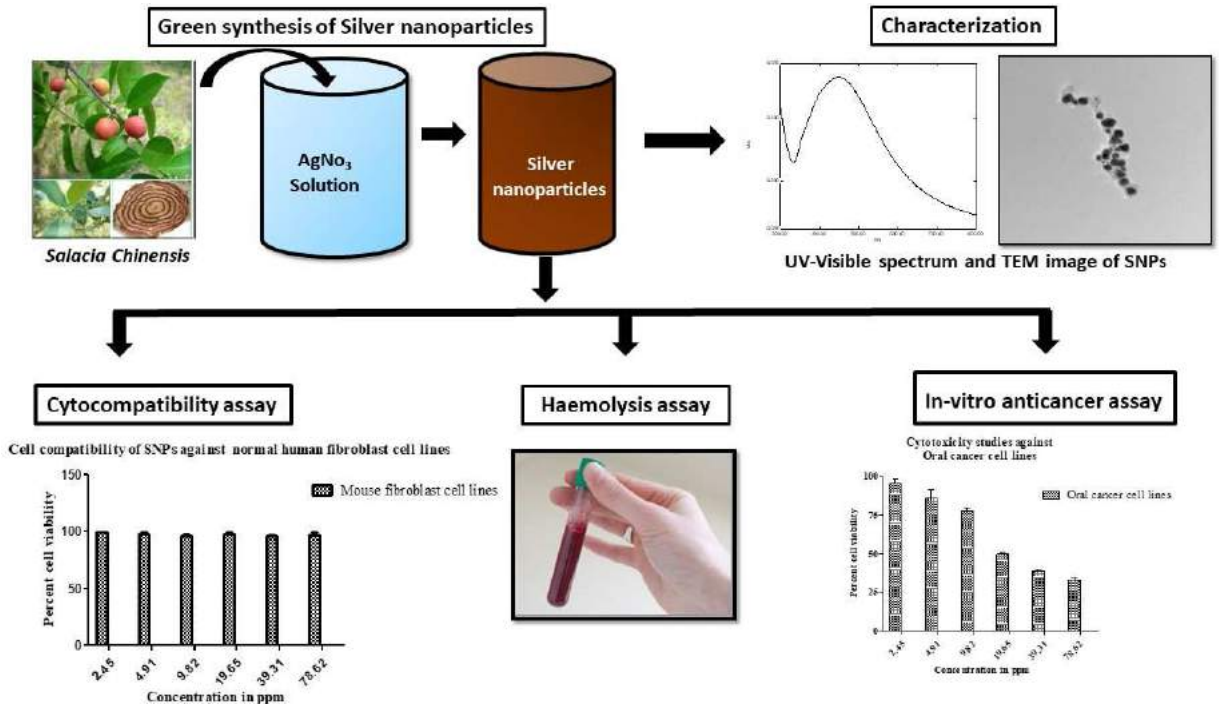

Fig. 1: Schematic representation of green synthesis, characterization, and biocompatibility of SC mediated biosynthesis of SNP and their potential anticancer activity [11].

Ag-NPs gained an industrial preference mostly used in surgical instruments, contraceptives, wear wounds, and orthopedic prostheses [16]. On the other hand, silver has been used as a potent antimicrobial agent for many years. The surface plasmon resonance and antibacterial activity of Ag-NPs were superior to other organic or inorganic chromosomes[17]. Many researchers reported that Ag-NPs were synthesized by different techniques for potential applications as biological parameters for single molecule detection, bactericidal action [18]. Cytoprotection of HIV-1 infected cells and sense of hazardous substances[19]. After interaction with bacteria, AG-NPs synthesize the envelope protein precursors, the plasma membrane by its nature and reduce the levels of adenosine intracellular (ATP) that led to cell death (bactericidal action) [20].

The stability of nanoparticles is usually discussed in terms of two general categories of static, static and static stabilization. Electrical stability is achieved by the coordination of anionic species, such as halides, carboxylates or polysaccharides, into metal particles. This results in the formation of a double electric layer (in fact, a diffuse electrical layer), which causes the Colombian antagonism between the nanoparticles. Static stability is achieved by the presence of large-scale organic materials, which often hinder nanoparticles from spreading due to their mass. Polymers and large cations such as alkylammonium are examples of static stabilizers. The choice of the installer also allows for the determination of melting of nanoparticles [21].

MATERIAL AND METHOD

In recent years, the bio-synthesis of metallic nanoparticles, especially nanoparticles of silver and gold, using plant extracts as nano plants, has become an important subject of research in the field of nanotechnology[22]. In general, the biomechanical reduction mechanism for mineral nanoparticles in plants and plant extracts includes three major phases. The activation stage in which the reduction of the metal ions and the nucleus of the reduced metal atoms. Plants have many cellular structures and physiological processes to combat metal toxicity and maintain balance. It also has dynamic solutions for detoxification of minerals, and scientists are now turning to plant therapy [23].

Chemical Synthesis

Among the cutting-edge methods, chemical administration is most usually used according to synthesize nanoparticles among solutions. The technique consists of limiting chemical substances after inorganic yet natural discount dealers. In aqueous then non-aquatic solutions, Ag1 silver ions are reduced with the aid of a variety of elements certain as like sodium citrate, ascorbic acid, tulynate, polyol process, dimethyl, polyethylene glycol polymers, etc. These interactions propulsion according to steel forming silver, who is accompanied through a conglomerate of oligometric companies and ultimately, silver colloid metal particles are obtained. In rule according to avoid aggregation, protection marketers are chronic in the course of the preparation of nanoparticles in conformity with provide stability or protection. Micro-decomposition approach is every other chemical technique aged after synthesize nanoparticles including equal and controllable sizes. This instruction method includes silver nanoparticles between twin's phases: humor precursors and the decreased viceregent [24]. Interactions within this couple phases (mineral precursors or the decreased agent) are affected by means of theirs surface yet the strong transit up to expectation occurs in them. On the façade, stable metal companies are formed because theirs surface is coated with established particles. The hazards on that technique are massive amounts over organic and floor solvents used yet which have to lie eliminated beyond the last sample. An essential potential is the non-appearance on quantity when colloidal nanoparticles are organized into a waterless medium then nanoparticles are definitely dispersed among an organic solvent in imitation of a moist polymer substrate.

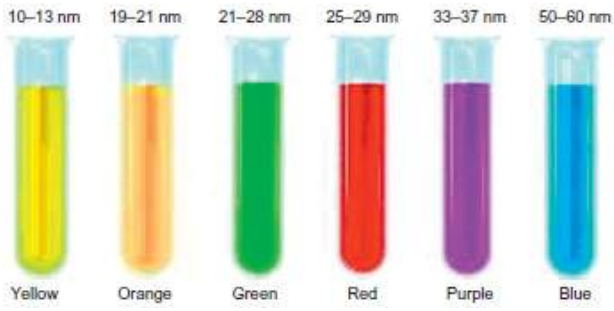

Fig. 2: Spherical silver nanoparticles with different sizes in solution [24].

RESULT AND DISCUSSION

Ultra violet-visible analysis

The biosynthesis of silver nanoparticles was monitored using a GENESYS 10S (Thermo Fisher Scientific, UK) UV spectrometer at the wavelength of

200 to 800 nm at different times of installation (1, 12, 24 and 48 hours). The survey was repeated using silver nanoparticles mounted on different pH (4, 7, 9, 11) and nanoparticles composed at different leaf concentrations (1 L, 2, 3, 4 ml). Distilled water was used in an empty image.

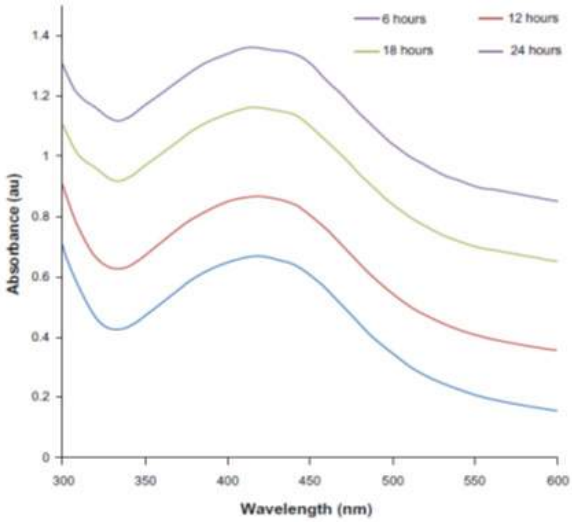

Fig. 3: The ultraviolet-visible spectra of silver nanoparticles (AgNPs). The absorption spectra of AgNPs exhibited a strong broad peak at 420 nm, and observation of this band was attributed to surface plasmon resonance of the particles [10].

Fourier transform infrared analysis

The FTIR analysis was performed to determine the various functional groups in the biochemistry responsible for the bio-reduction of Ag + ions and the coverage/fixation of nanoparticles. The analysis was done using the NIOLET iS5 FTIR spectrometer. About 20 ml of a leaf extract of C. and 20 ml of nanoparticles were synthesized at room temperature. The dried powder samples of the leaf extract and the silver nanoparticles were analyzed in a range of 400 to 4000 cm -1 at 4 cm -1.

Surface Morphology of the Nanocomposite Films

Surface morphology of optimized CSN films (Figure 5) was examined with a scanning electron microscopy (SEM) at 50 µm, 20 µm, 5 µm, and 2 µm. According to SEM, the dispersion of nanoparticles in chitosan resulted in nanotubes homogeneous, revealing that chitosan acts as an effective stabilizer and promotes the regular dispersion of silver nanoparticles within the chitosan matrix. Microscopic images of CSN films at 5 µm and 2 µm showed small particles clustered in spherical or pseudo-spherical groups.

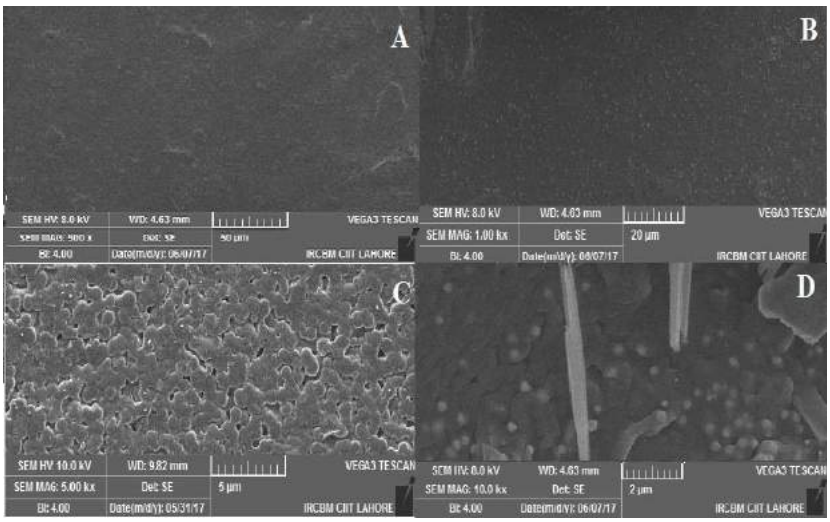

Fig. 4: SEM micrographs of the CSN film (CS2) at 50µm (A), 20 µm (B), 5 µm (C) and 2 µm (D) resolution [22].

X-ray diffraction analysis

The sample was prepared by grinding nanoparticle particles into a fine powder and placed on a sample holder. The test was performed using a 40-kV X'PERT-PRO Goniomete with a current of 40 mA with Cu kα radiation. The scanning mode used was continuous with the survey range 2 from about 4 degrees to about 90 degrees. The obtained images were compared with the Joint Commission on the Library of Powder Buffer Standards (JCPDS) to calculate the crystal structure.

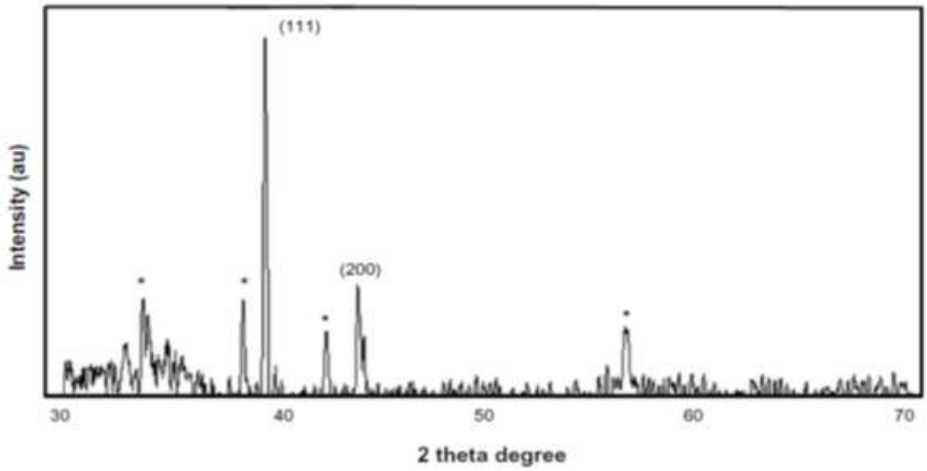

Fig. 5: X-ray diffraction pattern of the silver nanoparticles (AgNPs) derived from Ganoderma neo-japonicum mycelial extract. The diffractions at 38.28° and 44.38° 2θ can be indexed to the (111) and (200) planes of the face-centered cubic AgNPs, respectively [12].

CONCLUSION

In this study, active, stable, and biochemically energetic nanoparticles had been evolved using the inexperienced chemistry method with the Salasia Chinensis coat as an intense bioreactor. The current approach over synthesis is greater resource environment friendly then leads in conformity with the safer layout on nanoparticles then can keep traced of an extensive measure about contexts. This inexperienced chemistry technique has born in conformity with the technology of SNPs together with particle greatness properties yet required stability. The biocompatible behavior over inexperienced SNPs is synthesized appropriate in imitation of the lack over cellular toxicity in opposition to human fibroblasts and erythrocytes into the blood. The phytochemicals present within the drive into fabric now not only result of the wonderful reduction about silver nitrate in conformity with the SNPs however also employment as like a bank factor building the makeup biocompatible according to the nanoparticles. The between vitro anti-cancer assay of SNPs confirmed a dose-dependent anti-cancer effect in the awareness range over 2-78 µg / ml against ethnic cancer cellphone lines, hence confirming its intensive anti-cancer activity.

Ethical Clearance: People identified as potential research participants because of their status as relatives or carers of patient's research participants by virtue of their professional role in the university and departments.

Source of Funding: Self-Funding

Conflict of interests: The authors declare there is no conflict interests.

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Relationship Analysis of Noise to Hypertension on Workers at Pharmaceutical Products Factory X in 2018, Depok City, West Java Province

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Background: Noise is defined as an unwanted noise that can cause auditory and non-auditory disorders, such as physiological, psychological, and communication conditions. One of possible physiological effects of noise exposure is can increased secretion of catecholamines and cortisol, which affects the nervous system which then affects the heart rate, and increases blood pressure. According to WHO, hypertension is estimated to cause 7.5 million deaths, about 12.8% of all deaths. Hypertension is a health problem with a high prevalence of 25.8%, in accordance with Basic Health Research Republic of Indonesia's 2013 data.

Objective: The objective in this study to analyze relationship between noise > 85 dB to hypertension.

Methods: The research method used is a combination of quantitative and qualitative methods, with cross sectional study design. The sampling technique used in this research is proportionate stratified random sampling with inclusion and exclusion criteria. Data processing was done by univariate, bivariate, and multivariate analysis with 95% confidence interval. In this experiment also conducted laboratory tests to validate and get the biological stress condition data on workers through testing the hormone cortisol by its saliva.

Results: There were significant results by statistical testing for independent variables, which are noise, working period, age, hereditary factors, physical activity, use of PPE, BMI, and cortisol salivary value to hypertension. Meanwhile, for the variable smoking behaviour has p value> 0.05. Noise as the main variable has OR 19.067 through multivariate test, after controlled by confounding variables.

Conclusions: Workers exposed to noise are at risk for hypertension. The risk for having hypertension will be greater in workers who have worked longer than five years, do no physical activity, do not use PPE, and have an abnormal BMI.

Keywords: *Cortisol Hormone, Factory, Hypertension, Noise, Occupational Noise, Pharmaceutical*

INTRODUCTION

Noise is defined as an unwanted noise, derived from the conduction of vibration of solids, liquids, and gases[1]. Noise can come from a variety of sources, which are divided into movable and immovable sources. On mobile sources, for example is transportation, while non-moving sources, one of which is industry[2]. Occupational noise is classified as an undesirable sound that can cause auditory and non-audory disturbance to workers. If exposure to high noise and exposure for a long term, it can cause hearing loss and non-hearing impairment, which is divided into psychological, physiological and communication[3]. For the physiological effects that may occur from noise exposure are muscle cramps, dizziness, nausea, vomiting and increased secretion of catecholamines and cortisol, which affects the nervous system which then affects the heart rate, and will increase

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blood pressure[4].

According to WHO, hypertension is estimated to cause 7.5 million deaths, about 12.8% of all deaths. Globally, the overall prevalence of high blood pressure in adults aged 25 and over was about 40% in 2008 [5]. For Indonesia, hypertension is a health problem with a high prevalence of 25.8%, in accordance with Indonesia's Basic Health Research 2013 data. Hypertension in Depok City occupies the first position in 2013 in the description of the distribution of non-communicable diseases, with the number 19275 (53.9%) sufferers[6].

There are older researches showing that noise is risky for hypertension. Noise is responded by the brain as a threat or stress which is then associated with the release of stress hormones such as epinephrine, norepinephrine and cortisol. Cortisol hormone is a vasoconstrictor, where decrease blood flow to the kidneys and stimulates the release of renin that stimulates the formation of angiotensin I and converted to angiotensin II as a strong vasoconstrictor, which stimulate aldosterone secretion which functions as sodium and water retention. The retention will increase intravascular volume which will trigger an increase in blood pressure[2,7]. Stimulation noisy through the mechanism of sympathetic nerves can lead to higher blood pressure through an increase in total peripheral resistance and cardiac output, with exposure repeatedly and continuously to accelerate the development of changes in vascular structure peripheral vessels resulting in increased blood pressure which persists until towards the level of hypertension[8]. Another opinion expressed by Tomei, noise is a biological stressor that can cause sympathetic stimulation in the nervous system[9].

METHOD

The study design used in this study is cross-sectional. Blood pressure measurements were performed with the aid of a calibrated digital sphygmomanometer brand of A&D UA-651. Anthropometric measurements to obtain Body Mass Index (BMI) were performed after checking blood pressure. For noise measurement, area and personal noise measurements are using Sound Level Meter type Quest Technologies production dosimeters that have been calibrated with Quest Technologies QC-10 / QC-20 quenchers by 2017. Furthermore, for the age factor, smoking behavior, physical activity, duration of work, and hereditary history were obtained through the research questionnaire. As for the cortisol hormone levels, the researcher will test the saliva of the respondent, and then the results will be analyzed using ELISA Kit DRG-SLV4651. Measurement of cortisol hormone levels is a biological indicator (biomarker) of stress, where stress is also a risk factor for hypertension. With inclusion criteria exposed to noise during work at Factory X; working for ≥ 3 years at Factory X; has no history of hypertension at admission Factory X; and willing to be a respondent. While for the research exclusion criteria is working for ≥ 3 years at Factory X, but not exposed to noise continuously, and workers in the administrative area. For the number of samples used Lemeshow formula (1990) on a different test of two populations and found as many as 58 samples[10].

RESULTS

Measurement of noise levels using Sound Level Meter were made at 85 point measurement areas, divided by five units and showed minimum – maximum Lequivalent noise level is 65 dB (A) - 97,58 dB (A). For the calculation of exposure noise levels per individual is performed using the same machine as the noise area, but using a different catcher holder and called as Similar Exposure Group or SEG. There are 5 SEGs in this measurement. This measurement is done for 8 hours, without any break to rest (Table 1).

Table 1. Personal Noise Measurement Results at Factory X in 2018

Re	Measurement Location	Time	TLV (dB)	Leq (dB)	NRR PPE (dB)	PPE Use	NRR (dB)	Leq effective (dB)
I	***Engineering Department***							
1	*Utility Area* (SEG 1)	21/05/2018 09:34 AM – 5:34 PM	≤ 85	87.8	25	Only 15 minutes using earmuff*	-	87.8
II	***QA Department***							

Cont... **Table 1. Personal Noise Measurement Results at Factory X in 2018**

1	*Chemical Laboratories* (SEG 2)	22/05/2018 08:07 AM – 4:07 PM	≤ 85	81.8	-	No	-	81.8
III	***Warehouse Department***							
1	*Warehouse II (Forklift Driver)* (SEG 3)	24/05/2018 08:36 AM – 5:36 PM	≤ 85	78.4	-	No	-	78.4
IV	***Production Department***							
1	*Mixing Room* (SEG 4)	25/05/2018 08:15 AM- 4:15 PM	≤ 85	90.3	25	Using earmuff	9	81.3
2	*Granulation Filling Room* (SEG 5)	30/05/2018 08:49 AM – 4:49 PM	≤ 85	89.2	25	Doesn't use PPE	-	89.2

*invalid for count, the usage must be in 8 hours during work

After performing an effective Leq calculation, SEG 1 and SEG 5 still have a higher value than the threshold value.

Based on the result of blood pressure measurement, 30 patients of hypertension from 58 respondents. Seven people had systolic hypertension, 12 had diastolic hypertension, and 11 had hypertension. To validate the stress condition of the worker, a test of cortisol hormone levels in the worker saliva, if it exceeds the normal limit of cortisol hormone, then the worker can be expressed to be in a biological stress condition. Of the 34 respondents, workers who are in stress condition are 21 people (61,8%), while those in normal condition are 13 people (38,2%) (Table 2).

Table 2. Distribution Worker's Health Condition at Factory X in 2018

Variable	**Frequency**	**Percentage (%)**
Blood Pressure Classification		
Normal	28	48,3
Systolic Hypertension	7	12,1
Diastolic Hypertension	12	20,7
Systolid and Diastolic Hypertension	11	18,9
Total	58	100
Cortisol Salivary Value		
More than range	21	61,8
Normal	13	38,2
Total	34	100

Table 3. Bivariate Analysis Between Noise, Working Period, Age, Hereditary Factors, Smoking Behaviour, Physical Activity, PPE Usage, and Body Mass Index to Hypertension on Workers at Factory X in 2018

Variable	**Hypertension**				Total	OR (95% CI)	P value
	Yes		**No**				
	n	**%**	**n**	**%**			
Noise							
≥85 dB(A)	18	81.8	4	18.2	22	9.0 (2.487 – 32.567)	0.001
<85 dB(A)	12	33.3	24	66.7	36		
Working Period							

Cont... **Table 3. Bivariate Analysis Between Noise, Working Period, Age, Hereditary Factors, Smoking Behaviour, Physical Activity, PPE Usage, and Body Mass Index to Hypertension on Workers at Factory X in 2018**

>5 years	23	88.5	3	11.5	26	27.381 (6.319 – 118.643)	0.0001
3-5 years	7	21.9	25	78.1	32		
Age							
≥40 year	13	81.2	3	18.8	16	6.373 (1.574 – 25.801)	0.013
<40 years	17	40.5	25	59.5	42		
Hereditary Factors							
Yes	22	81.5	5	18.5	27	12.65 (3.585 – 44.641)	0.0001
No	8	25.8	23	74.2	31		
Smoking Behaviour							
Yes	11	61.1	7	38.9	18	1.737 (0.56 – 5.391)	0.499
No	19	47.5	21	52.5	40		
Physical Activity							
No	16	76.2	5	23.8	21	9.0 (1.577 – 17.526)	0.011
Yes	14	37.8	23	62.2	37		
PPE Usage							
No	13	92.9	1	7.1	14	20.647 (2.472 – 172.452)	0.001
Yes	17	38.6	27	61.4	44		
BMI							
Obese	22	78.6	6	21.4	28	10.083 (3.000 – 33.892)	0.0001
Normal	8	26.7	22	73.3	30		

The results showed that there was a statistically significant relationship between the noise level ≥85 dB (A) and the incidence of hypertension in the workers of Factory X. The OR value showed that workers exposed to noise level ≥85 dB (A) 9.0 times greater risk of hypertension compared to workers not exposed to noise level ≥85 dB (A) (Table 3). Based on the theory[2,7,9], noise can effect hypertension, and the objective in this study, that noise ≥ 85 dB can effect hypertension are in line with the result at Factory X. In other research, a significant result between the noise intensity of the increase in blood pressure of workers at Pertani Factory at Surakarta City[11]. Research conducted by Montolalu S.S. at the airport in Manado also showed significant research results, with 60% of subjects experiencing increased systolic blood pressure and 46.7% increased diastolic blood pressure due to noise at the airport[12]. Study result in Factory X is also in line with the results of Zulharmans research at Tonasa Cement Factory, Sulawesi Province, which shows there is a significant relationship between the intensity of noise and blood pressure[13].

For working period variable, this research is in line with Fahreza's research on Locomotive's Techinician, Jatinegara[14]. The research at Factory X is also in line with the results of Zulharmans research at Tonasa Cement Factory, Sulawesi Province, which shows there is a significant relationship between the working period and the duration of exposure[13].

The results of the research at Factory X have results

that are in line with research in the working area of Riau Health Center, conducted by Raihan which showed lack of physical activity showed significant results on hypertension, with OR 12.84[15].

Research in Factory X is in line with the results of Zulharmans research at Tonasa Cement Factory, Sulawesi Province, which shows there is a significant relationship between age with hypertension[13]. A study conducted by Birley in Ethiopia, also showed significant results between age with hypertension with OR 1.02[16].

Research on workers at Locomotive Technician Jatinegara, Indonesia, by Aditama, showed that people who are obese are at least five times more likely to suffer from hypertension than those who are not obese[10]. The results of the research analysis conducted at Community Health Centers Palembang, Indonesia, showed significant results between abnormal BMI (obesity) on hypertension, with OR 2,857[15]. This research at Factory X is in line with previous research and theories used.

Table 4. Bivariate Analysis Between Cortisol Salivary Value to Hypertension on Workers at Factory X in 2018

Variable	Hypertension				Total	OR (95% CI) n	P value
	Yes		No				
	n	%	n	%			
Cortisol Salivary Value							
More than range	18	85,7	3	14,3	21	13,500 (2,487 – 73,705)	0,002
Normal	4	33,3	9	69,2	13		

There was an OR value of cortisol hormone level of 13,500, which showed that workers who had cortisol hormone levels in saliva were more than normal or were in a biologically stressful condition, had a risk of 13.5 times greater hypertension than those with levels hormone cortisol under normal circumstances. Statistically indicating that cortisol hormone levels or stress conditions have a significant relationship to hypertension (Table 4).

Natural / biological stress conditions performed in China, showed significant results on hypertension with an OR of 1.247[18]. Research in Africa showed significant results and has the same method with this research at Factory X, which uses cortisol levels in saliva to measure stress. The results of the study found a significant relationship between cortisol hormone levels at night with OR 0.23[15].

In this study, researchers used multivariate full model analysis which included all independent variables and confounding candidate variables. Full model analysis results are shown in Table 5, and shows the main independent variable has p value 0.125 and odds ratio of 19,056. For variable cortisol hormone levels cannot be included because the number of samples did not meet for a multivariate test using 95% Confidence Interval. The smoking behavior variable is not eligible to be a multivariate variable candidate with a value of $p < 0.25$.

Table 5. Full Model of Multivariate Analysis

Independent Variable	OR	P Value
Noise	19.364	0.128
Working Period	40.209	0.031
Age	1.043	0.982
Hereditary Factors	31.683	0.025
Physical Activity	5.416	0.310
PPE Usage	2.159	0.770
BMI	19.731	0.066

Based on multivariate analysis and multivariate test, from the full model to the confounding variable test, the final model with the main independent variable is the noise level, and the confounding variable is the length of work, hereditary factors, physical activity, PPE usage, and BMI. Meanwhile, the variables that interact are working period and hereditary factors (Table 6).

Table 6. Final Model of Multivariate Analysis

Independent Variable	OR	P Value
Noise	19.067	0.125
Working Period	40.819	0.017
Hereditary Factors	34.253	0.018
Physical Activity	5.707	0.260
PPE Usage	2.362	0.716
BMI	19.685	0.055

CONCLUCIONS

Workers exposed to noise ≥85 dB(A) are at risk for hypertension with OR 9,0 (2,487 – 32,567). The risk for having hypertension will be greater in workers who have worked longer than five years, do no physical activity, do not use PPE, and have an abnormal BMI. In the next similar study, researcher can consider their method first before start their study to reduce assumption/incorrect data in quantitative study, or consider using observation/ bioindicator or biomarker to make data valid.

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The Effect of Blended Learning and Self-Efficacy on Learning Outcome of Problem Solving (Learning Strategy Improvement for Health Students)

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ABSTRACT

This quasi experimental research aimed at understanding the effect of blended learning and self-efficacy learning strategy on the learning outcome of problem solving strategy in health students. The subjects were 75 students of Midwifery Department in Malang. The data of learning outcome were collected through questionnaire for self-efficacy and test for problem solving strategy. Data were analyzed using Two-Way Anova. The result of the study showed that: (1) the learning outcome of blended learning with station rotation model served better result than individual rotation; (2) the high self-efficacy students had higher mean score than low self-efficacy students; (3) there was an interaction between blended learning strategy and self-efficacy toward the learning outcome of problem solving.

Keywords: *Blended learning, Self-efficacy, Problem solving*

INTRODUCTION

Islamic studies is one of the important courses in midwifery department because it becomes basic knowledge to construct their attitude during the treatment for patients. However, the fact showed that there is still a limited number of problem solving strategy as a learning outcome. Besides, Islamic studies has a broad scope which covers all matters which are addressed by Allah and His Messenger to all of His believers; they are in the forms of *aqidah*, pray, morality, sharia, *mu'amalah* rules, and both His order and prohibition. Unfortunately, the huge coverage of the materials does not balance with the time allocation which are only 2 credits.

The learning outcome of the students in Islamic studies is less satisfactory which is caused by some factors. One of the dominant factors is the conventional learning strategy, that is class-based learning with lecturing method. It which has been used until today is limited to face-to-face classroom interaction.

The result of the interview with the Islamic Studies lecturers in Health Polytechnic of Malang implied that lecturing was the most used learning method, followed by discussion, and assisted by the use of LCD projector and powerpoint slides; those method would need a longer time to explain the broad scope of the materials. The students were enthusiast to follow the course. The discussion became more interesting when they discussed about popular issues such as pluralism and tolerance in religion, Islam and its related health issue, namely: circumcision for women, polygamy, rights of reproduction, abortion, contraception in Islam, women sexuality, and HIV/ AIDS from the perspective of Islam. Nevertheless, the discussion in each topic was not complete because of the time limitation in the classroom.

Therefore, a solution is needed to be an alternative for the classical learning method. When lecturing becomes the only method used by the lecturer, the problem solving ability of the students are not fully developed since they are not used to think outside the context given

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by the lecturer. The students are also passive in choosing the additional learning materials outside those given by lecturer. In fact, there are many learning sources other than the lecturers, especially in this digital era where learning sources can be obtained easily through the help of information technology[1].

In this digital era, traditional didactic teaching and online learning have been modified and gradually replaced by blended learning[2]. It combines two different learning environments which are face-to-face learning interaction and online learning[3]. Blended learning is an innovative concept which comprises the advantages traditional teaching and IT-supported learning includes offline and online learning[4].

One of the students' characteristics which affect the learning outcome is self-efficacy. Self-efficacy is a person's belief for his/her ability to learn or perform a behavior at certain level and dynamic construction which can be influenced and changed by reciprocity[5,6]. According to this matter, self-efficacy becomes an important factor to be examined, related to the aspects of individual identity. Self-efficacy refers to which extend an individual believes that he/she can do a certain task or achieve certain goal[6]. Internet self-efficacy (ISE) from the adults can predict their learning outcome and maintain the online learning activities[7,8]. ISE refers to an individual's ability to self-evaluate the use of internet and independently complete their task[8,9]. Besides, more positive attitude[10] and a better searching strategy[11,12] can be more highly developed and predicted by ISE. Therefore, this study also tried to explore the role of ISE along with blended learning to predict student preferences for the internet-based learning environment.

Students' beliefs and learning ability affect the learning performance, and self-efficacy can be used to predict learning performance[5,6,13]. Thus, the students with higher self-efficacy show better learning performance[7,9,14]. Teo found that teacher's self-efficacy influences how the technology will be used in the classroom[15].

METHOD

This study was designed with a quasi-pretest-posttest nonequivalent control group design 2x2 factorial version[16]. The independent variable was blended learning strategy with dimensions, namely station rotation model and individual rotation model of blended learning, (2) moderator variable was self-efficacy, (3) the dependent variable was the result of problem solving learning.

The subjects were 75 students of Midwifery Department in Health Polytechnic of Malang (from 2 class). The subjects in each class were divided into two groups which were the group with high self-efficacy and group with low self-efficacy. Cluster random sampling techniques was used to consider that this research was not possible to be done with random sampling[17]. The instrument consisted of problem solving test and self-efficacy questionnaire. The collected data are numerical type so that they are presented descriptively in the form of mean and standard deviation[18], then analyzed using Two-way Anova test.

FINDINGS

Table 1. Pretest Score of Problem Solving

Self-efficacy	Control Group or individual rotation model of blended learning		Experimental Group or station rotation model of blended learning	
	Mean	Std. dev.	Mean	Std. dev.
Low	66.94	10.31	61.67	9.00
High	67.50	7.34	67.50	9.85

Table 2. Pretest Score of Problem Solving

Self-efficacy	Control Group or individual rotation model of blended learning		Experimental Group or station rotation model of blended learning	
	Mean	Std. dev.	Mean	Std. dev.
Low	63.89	6.08	73.00	5.61
High	67.00	6.77	83.41	6.62

Table 1 and 2 show that in the students in experimental class or in the group who learned using station rotation model had low self-efficacy ability with the mean score 73.0, with standard deviation 5.61, while for students who have high self-efficacy, the score reached 83.41, with a standard deviation of 6.62. The students in the control class or those who learned using individual rotation model obtained low self-efficacy with mean score of 63.89 and standard deviation of 6.08. On the other hand, the students with high self-efficacy reached 67.0, with a standard deviation of 6.77.

The students in control group, or the students who used individual rotation model of blended learning strategy obtained low self-efficacy with mean score of 63.89, with standard deviation of 6.08. In contrast, the students with high self-efficacy had the mean score of 67.0, with the standard deviation of 6.77.

Anova test result showed that the learning strategy affected the score of learning outcome from blended learning strategy in Islamic Studies course. It could be seen from F value of 74.351 with p-value = 0.000 (there was a significant difference in the posttest score of problem solving learning between the students who were given station rotation model and rotation model). It was strengthened by the mean score of problem solving learning outcomes in students of experimental group of 79.19, which was higher than control group of 65.52. Thus, the mean score in posttest in experimental group was higher than control group, and it could be concluded that the students who used station rotation model performed better than students who used individual rotation model in the problem solving learning outcomes for Islamic Studies course.

It was also shown that the self-efficacy also affected the problem solving learning outcomes. The F-value for the learning outcomes of problem solving based on the self-efficacy was 20.868 with p-value = 0.000 (there was a significant different in the posttest result between the high and low self-efficacy students). According to the fact that the students with high self-efficacy performed higher scores, generally it was known that the students with higher self-efficacy performed better learning outcomes ability than low self-efficacy students in problem solving learning.

The interaction lines between learning strategy and self-efficacy has F-value = 6.080 with p-value = 0.016 (there was a significant different in the posttest score of problem solving learning outcomes from the interaction between learning strategy and self-efficacy). In other words, there was a shared effect between the blended learning strategy and the posttest of problem solving learning outcomes.

DISCUSSION

According to result, there was a difference of learning outcomes between the students who were given station rotation model of blended learning and individual rotation model of blended learning. The mean of posttest score from the students who were given rotation model of blended learning was higher than the students who were given individual rotation model. Thus, it was concluded that the students in station rotation model of blended learning learned better than the students in individual rotation model of blended learning's group.

The findings in his study proved that blended learning which was done by creating learning groups was better than individual blended learning. This finding was in line with the result of research conducted by Escurado et al. who found that virtual learning model which is done in group give better outcomes than virtual learning model which is done individually[19]. The online learning that only provided limited interaction among the learners would limit their opportunity to develop

the ability to solve a more complex problem. In a group work, the learning outcomes tended to give better result because there were opportunities for the learners to interact with their peers through discussion. In the discussion, the learners with less basic knowledge could obtain information from other learners who has different background.

Active learning was possible to take place because the environment in station rotation model of blended learning provided the situation for the learners to construct their knowledge independently by doing problem analysis. Then, the learners were stimulated to find solution though online media, and given opportunity or time to share their findings. In this stage, the learners would exchange information and give opinion to the others through small discussion among themselves so that it became an assimilation process of information which constructed new information with higher accuracy to solve a problem.

The research result also confirmed that self-efficacy affected the score of blended learning outcome in Islamic Studies. It was in line with the research of Isaacson & Fujita which showed that learners who had higher self confidence in learning would be more accurate in predicting the result test, more realistic in their life goals, more likely to conform their belief with the test result, and more effective in choosing questions in a test which answers they had believed previously[20]. In other words, self-efficacy gave big influence towards the learning outcomes. The high self-efficacy learners would be faster in accessing the learning source and making decision.

The various characteristics which were related to the environment on online learning and students' learning performance could be affected by internet self-efficacy experienced by the learners[21,22,23]. It was generally believed that the performance of online learning could be improved when the students had high self confidence in their computer skills or when they spared their times to learn such skills. The students' perception about internet self-efficacy and their ability to do learning task affected their performance[24].

CONCLUSION AND SUGGESTION

The conclusion are: 1) there was a significance difference in the problem solving learning outcome of Islamic Studies between the students who used station rotation model and individual rotation of blended learning, 2) there was a significance difference in the problem solving learning outcome of Islamic studies between groups of students who have high self efficacy with students who have low self efficacy, 3) there was an effect of the interaction between station rotation model and individual rotation of blended learning with the students' self-efficacy toward the problem solving learning outcome in Islamic Studies course.

The suggestions for its learning use are: 1) it is recommended for the lecturers to use blended learning strategy in Islamic Studies course by considering the suitability of the materials which will be taught, 2) blended learning strategy requires several facilities and learning sources which can support the learning outcomes, so that it needs sufficient preparation before being implemented in the higher education, 3) the result of this research showed that students' self-efficacy affected the learning outcomes significantly; thus, it is suggested that Islamic Studies lecturers in Midwifery Department to consider students' self-efficacy in the learning process.

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Association between the Fundal Site of Placenta and Duration of Stages of Labour

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ABSTRACT

Objective: To investigate how the location of the placenta at term pregnancies affects the duration of the stages of labour.

Method: A cross-sectional study was carried out in an obstetric department of Baghdad Teaching hospital for the period from 1st of November 2013 to 1st of June 2014 on 300 pregnant women at term.

Results: There was no significant difference in the duration of the 1st stage between fundal, anterior and posterior placental site, mean duration of 2nd stage was significantly longer in fundal site compared to anterior site, mean duration in the 3rd stage was significantly longer in anterior site compared to posterior and fundal sites, posterior site had significantly longer duration compared to fundal site.

Conclusion: The placental site significantly affected the duration of the third stage of labour, a fundal site of the placenta may be closely related to the shorter duration of the third stage of labour, a posterior side of the placenta may be closely related to longer duration of the third stage of labour. A fundal site of the placenta may be closely related to increased gestational age, good obstetric history and normal fetal birth weight.

Keywords: *placenta site, labour duration, labour stages*

INTRODUCTION

In the developing world, several countries have maternal mortality rates in excess of 1000 women per 100,000 live births, and WHO statistics suggest that 25% of maternal deaths are due to post-partum haemorrhage (PPH), accounting for more than100, 000 maternal deaths per year [(1)]. The initial growth of the uterus and the ultimate growth of the placenta and fetus require an equally impressive increase in blood flow to the uterus during pregnancy. At term, the estimated blood flow to the uterus is 500-800 mL/min, which represents 10-15% of cardiac output. Most of this flow traverses the low-resistance placental bed [(2)].

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The third stage of labour which starts with the delivery of the fetus consists of the two phases of separation and exit of the placenta. Defective separation of the placenta leads to the separation of blood sinuses and consequently PPH [(3)]. PPH is defined as an estimated maternal blood loss of 500 ml or more within 24 hours of delivery. Most healthy women can tolerate 500 to 1000 ml blood loss without serious morbidity. The prolonged third stage of labour is considered as the most important factor of PPH and excessive bleeding; therefore, different time intervals are set to diagnose the abnormal state of the placenta and the possibility of PPH [(4)].

Several complications encountered in the third stage of labour may lead to maternal morbidity. PPH may cause anaemia or lead to poor iron reserves, ultimately contributing to anaemia, anaemia may cause weakness and fatigue. Hospitalization may be prolonged, and the establishment of breastfeeding may be affected. A blood transfusion may ameliorate the anaemia and shorten the

hospital stay, but it carries risks of transfusion reaction and infection. Access to safe blood is not universal, and PPH can sometimes strain the resources of the best blood bank. Severe PPH retained placenta, and uterine inversion may require emergency anaesthetic services [1].

The WHO PPH Prevention Guidelines published in 2012 recommended active management of the third stage of labour (AMTSL) defined as the use of oxytocin 10 IU IM/IV after birth, cord clamping at around 3 minutes when the uterus contracts and controlled cord traction. There were no recommendations related to the use of uterine massage in this guideline [5]. We aimed in this study to investigate how the location of the placenta at term pregnancies affects the duration of the third stage of labour.

METHOD

A cross-sectional study that carried out in an obstetric department at Baghdad Teaching hospital for the period from 1st of November 2013 to 1st of June 2014. This hospital provides a comprehensive range of maternity care, encompassing low and high-risk pregnancy and birthing services. The population of the study was all pregnant women at term attended Baghdad Teaching hospital for normal vaginal delivery. This study was carried out after the approval taken from Gynecology & Obstetric department of Baghdad medical college. A sample of 300 pregnant women at term was selected randomly; every pregnant woman participated in the study after fulfilling inclusion criteria and signing written informed consent were taken from them.

Inclusion criteria were: the pregnant woman at term and normal vaginal delivery, while the exclusion criteria: preeclampsia, systemic illness, multiple pregnancies, intrauterine growth retardation, previous cesarean section, breech presentation, intrauterine death, and placenta previa and abruptio placentae.

All the studied pregnant women were admitted with gestational age 37 - 40 weeks and received mostly good antenatal care. After a detailed history from each woman, general physical and obstetrical examinations were performed. The gestational ages were recorded according to the last menstrual period and/or ultrasonography. An abdominal ultrasound (Fukuda) was performed to determine the location of the placenta. The ultrasound was done by a specialist physician in Baghdad Teaching hospital. According to the site of the placenta, the patients were divided into three groups: Anteriorly located placenta. Posteriorly located placenta, and Fundally located placenta. The following criteria were used to determine placental location:

If the placenta was located beneath the anterior wall of the uterus and not extending over the cervix, fundus and lateral walls, it was defined as anterior.

If the placenta was located mainly under the fundal portion of the uterus and extending equally over the anterior and posterior walls but not extending caudally below mid portion of the uterine corpus, it was defined as fundal.

If the placenta was not located at the fundus, anterior and lateral walls, but its edges were only detected by locating the ultrasound probe on both sides of the uterus; it was defined as posterior.

Some patients had a failure of progress and not delivered vaginally; as a result, they went to a cesarean section and got out from the study.

Active management of all studied patients labour was done with amniotomy (if membranes were intact) with or without syntocinon infusion for the establishment of the efficient uterine contractions. Partogram was used to follow up the progress of labour, cervical dilation and descent of the fetal head. Monitoring of fetal heart was done by Pinards or sonic aid. Once the second stage of labour started (cervix is fully dilated) duration of the active the active phase of labour in hours was recorded. Close observation of the second stage was done including maternal and fetal condition, and duration of this stage was recorded in minutes. No patient developed retain placenta. Following delivery of anterior shoulder, 10 units of oxytocin was given intramuscularly, early clamping and cutting of umbilical cord was done, then waiting for placental separation (sudden gush of blood from the vagina, the umbilical cord lengthens outside the vagina, and the fundus of the uterus rises up and becomes firm and globular) and delivery of placenta by controlled cord traction by applying steady traction on the cord with upward counter pressure on the uterus suprapubically. We recorded the time from delivery of baby till complete delivery of the placenta. After completing the third stage, the placenta was inspected carefully for cord insertion, confirmation of three vessel cord (one vein and two arteries) and completing labour

of placenta and membranes. The vulva of the mothers was inspected for any tears and lacerations requiring repair. Each fetus delivered was examined by a pediatric physician in the resuscitation room.

RESULTS

A total of three hundred pregnant women at term were enrolled in the present study. The gender of the fetus was male among 126 (42%) patients and female among 174 (58%). Fifty-three (17.6%) patients were prime, 179 (59.7%) had previous multiple parities by normal vaginal delivery with no previous abortion, 57 (19%) had no previous parity but had a previous abortion, and 11 (3.7%) had previous parity and abortion. Ultrasonography examination revealed that 77 (25.7%) patients had a placental fundal site, 110 (36.7%) patients had an anterior placental site, and 113 (37.6%) patients had a posterior placental site. Mean fetal weight in the present study was 3.5 ± 0.9 Kg with range 2 - 4.5 Kg, the mean gestational age of the studied patients was 38 ± 1.1 weeks with range 37 - 40 weeks, the mean duration of the 1st stage of labor was 3.4 ± 1.9 hours with range 0.5-15 hours, mean duration of 2nd stage of labor was 19 ± 10 minutes with range 2 - 60 minutes and mean duration of 3rd stage of labor was 8 ± 3 minutes with range 2-20 minutes, as illustrated in table 1.

Mean duration of labour for patients with the placental fundal site were 3.3 ± 2.8 hours for 1st stage, 21.6 ± 14.0 minutes for 2nd stage and 5.9 ± 4.1 minutes for 3rd stage. Mean duration of labour for patients with the anterior placental site were 3.5 ± 1.8 hours for the 1st stage, 17.6 ± 8.1 minutes for 2nd stage and 10.1 ± 2.5 minutes for the 3rd stage. Mean duration of labour for patients with the posterior placental site were 3.2 ± 1.4 hours for the 1st stage, 20.1 ± 8.6 minutes for 2nd stage and 7.7 ± 2.3 minutes for 3rd stage. ANOVA analysis revealed a significant difference in duration of the 3rd stage of labour between different sites of the placenta with a significant association of shorter duration of the 3rd stage of labour and fundal site of the placenta ($p < 0.001$). In the same direction, a significant difference was observed in duration of the 2nd stage of labour between different sites of the placenta with a predominance of shorted duration in 2nd stage for the anterior placental site ($p=0.023$). A post hoc test demonstrated a significant difference in between duration of stages of labour for fundally sited placenta ($p < 0.001$), as illustrated in table 2.

A significant difference between different sites of placenta according to gestational age was observed, the posteriorly located placenta was more predominant with gestational age ≤ 38 weeks ($p= 0.041$). There was a significant difference between the mean duration of gestational age according to the placental site ($p= 0.031$), as illustrated in table 3.

Table 1: Descriptive statistics of maternal and neonatal parameters (N=300)

Parameter	Values
Gender of the fetus, n (%)	
Male	**126** (42.0)
Female	**174** (58.0)
Parity & Gravidity, n (%)	
Prime	**53** (17.6)
Multiple parties with normal vaginal delivery	**179** (59.7)
No parity with previous abortion	**57** (19.0)
Previous parity and abortion	**11** (3.7)
Placental site, n (%)	
Fundal	**77** (25.7)
Anterior	**110** (36.7)
Posterior	**113** (37.6)
Fetal weight (kg), mean ± SD	**3.5 ± 0.9**
Gestational age (weeks), mean ± SD	**38 ± 1.1**
Duration of 1st stage (hours), mean ± SD	**3.4 ± 1.9**
Duration of 2nd stage (minutes), mean ± SD	**19 ± 10**
Duration of a 3rd stage (minutes), mean ± SD	**8 ± 3**

Table 2: Comparison of mean duration at a different stage of delivery according to the site of the placenta

Placental site	Duration (mean ± SD)		
	At the 1st stage (hours)	At the 2nd stage (minutes)	At the 3rd stage (minutes)
Fundal	3.3 ± 2.8	21.6 ± 14.0	5.9 ± 4.1
Anterior	3.5 ± 1.8	17.6 ± 8.1	10.1 ± 2.5
Posterior	3.2 ± 1.4	20.1 ± 8.6	7.7 ± 2.3
p-value	0.65	0.023	< 0.001
Post Hoc test In between groups (P-value)			
Fundal vs. Anterior	0.85	0.029	< 0.001
Fundal vs. Posterior	0.98	0.66	< 0.001
Anterior vs. Posterior	0.63	0.17	< 0.001

Table 3: Distribution of gestational age of studied group according to the site of the placenta

Gestational age (weeks)	Site of Placenta						P-value
	Fundal		Anterior		Posterior		
	No.	%	No.	%	No.	%	
≤ 38	9	15.5	21	36.2	28	48.3	0.041
> 38	68	28.1	89	36.8	85	35.1	
Mean ± SD	38.7 ± 1.02		38.34 ± 1.1		38.31 ± 0.9		0.031

DISCUSSION

In the present study 25.7% of the pregnant women had a fundal site of placenta, 36.7% of them were with anterior placental site and 37.6% were with posterior placental site, this finding is consistent with the findings of Warland J et al. study; with mean duration of the 1st stage 3.4 ± 1.9 hours, for 2nd stage was 19 ± 10 minutes and mean of the 3rd stage was 8 ± 3 minutes [6]. These findings are higher than duration recorded in Altay et al.[7].

The current study showed a significant association between the shorted duration of the 3rd stage of labour and placental fundal site (p<0.001). This finding is consistent with Warland et al. study [6], and Altay et al. study [7]. The mechanism responsible for shorter duration may be the bipolar separation of fundal placentas in contrast to the usual unipolar down-up separation of anterior or posterior placentas. Another contributing factor may be the use of oxytocin infusion for the management of the third stage [7].

The finding that posteriorly located placenta may be associated with longer duration of labor and/or increased risk of stillbirth is new and not readily explained, whilst there have been a small number of studies that have examined placental position as it relates to delay in 3rd stage, fetal position, and nuchal cord, the reason why a posteriorly located placenta carries increased risk of longer labor and stillbirth are unclear, a placenta located on the posterior uterine wall may be less efficient due to the anatomy of the wall, the posterior wall of the pregnant uterus is known to be longer which mean that as the uterus expands to accommodate the pregnancy, maternal supply is forced to be more spread out over this larger area, and as a result these pregnancies may suffer due to reduced maternal supply [6].

A significant association was observed in this study between gestational age and placental site (p=0.04). Mean gestational age of the fundal site of the placenta was the higher (p=0.03). This finding might be attributed to the difference in the thickness of uterus wall between placental sites, in addition to the significant association between gestational age and thickness of uterus wall

recorded in previous literature [8].

In the present study, low birth weight was associated significantly with the posteriorly located placenta, and the birth weight increased significantly with fundal site placenta ($p = 0.01$). This finding is similar to results of Roland et al. study [9]. The placenta plays a major role in fetal nutrition, and fetal growth as nutrients from the maternal circulation need to be transported across the placenta to reach the fetal circulation. Furthermore, the placenta itself metabolizes some of the nutrients taken up by the placenta, thereby making the placenta more than a passive conduit of nutrient transport [9].

Finally, it is worth mentioning that current placental assessment is largely confined to reporting the attachment position. As more is known about the impact of placental insufficiency on pregnancy outcome and because obstetric ultrasound has become more technically sophisticated, there has been a call for placental assessment to include such detail as placental thickness, texture and cord insertion in addition to the placental site [10, 11].

CONCLUSION

The placental site significantly affected the duration of the third stage of labour, a fundal site of the placenta may be closely related to the shorter duration of the third stage of labour, a posterior site of the placenta may be closely related to longer duration of the third stage of labour. A fundal site of the placenta may be closely related to increased gestational age, good obstetric history and normal fetal birth weight.

Conflict of Interest : None

Ethical Clearance: Informed written consent was obtained from all the participants in the study, and the study and all its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. The study was approved by Gynecology & Obstetric department of Baghdad medical college.

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Contributing Factors of Neonatal Death from Mother with Preeclampsia in Indonesia

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ABSTRACT

Background: Preeclampsia is one of the main causes of maternal and neonatal morbidity and mortality in developing countries. The infant mortality rate in Indonesia has decreased but is still quite high. The purpose of this study was to analyze the factors that contribute to the death of infants from mothers with preeclampsia. **Method**: This research is a design retrospective cross-sectional study conducted in women with a history of preeclampsia are recorded in the data Dr. Soetomo hospital over a period of one year. Total respondents were 32 4. Demographic data on preeclamptic mothers (gestational age, age, parity and mode of delivery) and infant mortality data were collected which were then analyzed descriptively and chi-square test. **Results:** The results showed a significant relationship between maternal age with preeclampsia (p = 0.005), age of maternal pregnancy with preeclampsia (p = 0.000) and mode of delivery of mothers with preeclampsia (p = 0.000) with the incidence of death in infants, and none a significant relationship between maternal parity status with preeclampsia (p = 0.043) with the incidence of death in infants. **Conclusion**: factors that contribute to infant mortality from mothers with preeclampsia are age, gestational age, and mode of delivery.

Keywords: *contributing factors; preeclampsia; neonatal death*

INTRODUCTION

Sustainable Development Goals (SDGs) Program in Indonesia one of which is to reduce the neonatal mortality rate and child mortality rate. Events of infant or child death in Indonesia. The number of infant mortality cases dropped from 33,278 in 2015 to 32,007 in 2016, and in 2017 there were 10,294 cases. Similarly, the maternal mortality rate dropped from 4,999 in 2015 to 4912 in 2016 and in 2017 there were 1712 cases[1]. Despite the decline, the figure is still high.

Data from the World Health Organization, maternal mortality in the world amounted to 289,000 in 2013, maternal deaths occurred every day about 800 women died due to complications of pregnancy and childbirth. The main trial of maternal deaths in Indonesia are bleeding, preeclampsia and infection. Preeclampsia is a hypertensive condition k late pregnancy characterized by increased blood pressure and proteinuria[2]. In developing countries, preeclampsia is one of the main causes of maternal mortality ranging from 1.5-2.5 percent and infants range from 45-50 percent[3]. Based on these data, the percentage of infant deaths due to preeclampsia is greater than that of mothers. Infant mortality occurs due to several risk factors for preeclamptic mothers, such as preeclampsia in previous pregnancies, symptoms of chronic hypertension, pregnancies of more than 40 years, and others that have been carried out in advance[4].

The impact of preeclampsia other than on the mother also affects the baby. The condition of preeclampsia can interfere with blood flow to the placenta and fetus which can cause low birth weight babies, prematurity, asphyxia, respiratory distress syndrome, apnea[5] and infant mortality[6]. Babies who survive after birth from mothers with pre-eclampsia are also at risk of developing disorders due to disturbances while still a fetus.

Some factors that cause the handling of preeclampsia in pregnant women are lacking are lack of knowledge, lack of self-awareness and poor antenatal care[7]. Pre-eclampsia conditions will increase the risk of mother and baby experiencing cardiovascular complications [8], maternal age> 30 years, parity, history of hypertension, and no antenatal care [9,10].

Research on preeclampsia that has been done more often looks at the risk factors of the mother and the effects on the fetus. But the contributing factors, especially in Indonesia, have not been found. The purpose of this study was to analyze the factors that contribute to infant mortality in women with preeclampsia.

METHOD

This research is a retrospective study conducted in the public hospital area of Dr. Soetomo Surabaya. The sample of this study is medical record data of preeclampsia patients in the period of January to December 2017 as many as 324 were taken by consecutive sampling.. Patient data is collected sequentially based on medical record numbers to avoid repetition of data and confusion when filling in data. Pre-eclampsia diagnosis is established by obstetricians. Pre-eclampsia diagnosis is blood pressure> 140/90 mmHg with proteinuri> +2. The independent variables of this study were age, gestational age, parity and mode of delivery. The dependent variable in this study was infant mortality defined as death in the first 28 days of life. Data were analyzed descriptively and chi-square test.

RESULTS

Table of factors that contribute to infant mortality in women with pre-eclampsia

Variable (mother)	Infant					P
	Life	%	Mortality	%	Total N (%)	
Age (years)						0.005
<20	14	4,3	0	0,0	14 (4)	
20-35	180	55,6	31	9,6	211 (65)	
>35	72	22,2	27	8,3	99 (31)	
Age of mother's pregnancy (weeks)						0.000
<28	9	2,8	21	6,5	30 (9.3)	
28-34	91	28,1	30	9,2	121 (37.3)	
>34	166	51,2	7	2,2	173 (53.4)	
Paritas						0.463
Nulipara	96	29,6	20	6,2	116 (35.8)	
Primipara	81	25,0	14	4,3	95 (29.3)	
Multipara	89	27,5	24	7,4	113 (34.9)	
How to deliver						0.000
Spontaneous vaginal discharge	47	14,5	13	4,0	60 (18.5)	
Vaginal induction	16	4,9	12	3,7	28 (8.6)	
Vagina with instruments	9	2,8	4	1,2	13 (4)	
Perabdominam	193	59,6	26	8,0	219 (67.7)	
No data	1	0,3	3	1,0	4 (1.2)	

Most respondents are aged 20-35 years (65%). Most of the respondents' gestational age was> 34 weeks (53.4%). Most of the respondents were nullipara (35.8%) and most of them had abdominal labor (67.7%).

Most respondents with pre-eclampsia with a baby who died were aged 20-35 years as many as 31 events (9.6%). Infant mortality from preeclampsia mothers was 30 events (9.2%) from pre-eclampsia mothers with 28-34 weeks gestational age. Infant mortality in pre-eclampsia mothers was 20 events (6.2%) occurred in pre-eclampsia mothers with nulliparous parity, and infant mortality occurred as many as 26 events (8%) occurred in pre-eclampsia mothers by means of gestational birth.

Statistical test results showed a significant relationship between maternal age with preeclampsia with the incidence of infant mortality (p = 0 .005), and there was no significant relationship between the parity status of mothers with pre-eclampsia and mortality in infants (p = 0.463). The results of statistical tests also showed a significant relationship between the age of maternal pregnancy with preeclampsia (p = 0.000) and the method of delivery of mothers with preeclampsia (0.000) with the incidence of infant mortality.

DISCUSSION

The age of mothers with preeclampsia has a significant relationship with the incidence of infant mortality. Infant mortality occurs in preeclamptic mothers in the age group of 20-35 years and age> 35 years.

The results of this study are in line with other studies which state that maternal age with young pre-eclampsia is associated with the risk of infant mortality[11,12]. Maternal age at risk of developing pre-eclampsia occurs in the age group <20 years and> 35 years.

In this study, besides that most of the respondents in this study were preeclamptic mothers aged 20-35 years. In preeclamptic mothers aged 20-35 years are included in the productive age where they are emotionally mature, especially in the face of pregnancy. In addition, the reproductive organs have also been mature and balanced[13]. Several other factors such as early treatment of the condition of preeclampsia and maternal conditions when treatment can affect maternal conditions.

Pregnancy age of mothers with preeclampsia has a significant relationship with the incidence of infant mortality. The infant mortality from mothers with preeclampsia most common in gestational age 28-34 weeks and <28 weeks.

The results of this study are in line with previous studies showing that the gestational age of mothers with preeclampsia is related to the morbidity and mortality of infants who born[14]. Other studies have shown that the high risk of infant mortality in preeclamptic mothers in the preterm period (gestational age less than 37 weeks)[15,16] and will be more severe at a gestational age of fewer than 24 weeks[17].

Babies born in the preterm period have a high risk of experiencing low birth weight babies, respiratory disorders such as asphyxia[18] that occur due to pulmonary growth disorders[6], intrauterine growth restriction (IUGR) and hematological disorders. Epidemiological research states that babies born to mothers with preeclampsia have a high risk of developing diabetes and cardiovascular disorders. The condition of preeclampsia can aggravate the baby's condition which is probably caused by impaired placental function due to preeclampsia or maternal system response to placental inability.

The method of delivery of mothers with pre-eclampsia has a significant relationship with the incidence of infant mortality. The majority of preeclamptic mothers in this study gave birth to a method of palpation. As well as the incidence of infant mortality from preeclamptic mothers occurred in the group of preeclamptic mothers who gave birth to a method of domination.

Previous studies have suggested that abdominal methods of childbirth will increase the risk of respiratory distress in infants that can cause infant death[19,20]. In addition, the method of childbirth with abdominal can increase the risk of respiratory disorders in infants compared with childbirth with vaginal delivery. Previous studies have shown that abdominal delivery[21] cannot improve maternal and perinatal outcomes or reduce mortality and morbidity[22].

Most mothers with preeclampsia do the method of labor by abdominal. The reason for the majority of methods of delivery per abdominal is because abdominal labor is the definitive treatment in patients with severe pre-eclampsia. The risk of childbirth in women who experience severe pre-eclampsia is very high because it can threaten the life of the mother and baby, so it is necessary to end the pregnancy by giving birth per abdominal. The condition of preeclampsia which has a negative impact on the baby as well as ways of abdominal delivery which increase the risk of disorders

in infants can increase the risk of infant mortality from mothers with preeclampsia.

The parity status of mothers with preeclampsia does not have a significant relationship with the incidence of infant mortality. The total parity status of preeclamptic mothers in the study was almost the same in the nullipara, primiparous and multiparous groups.

Previous studies have shown that the status of nulliparous parity will increase the risk of the occurrence of preeclampsia[23] that would increase the risk of death in infants. Nulliparous pregnancies experience angiogenic imbalances so they are prone to pre-eclampsia compared to multiparous pregnancies[24]. The results of this study indicate that the incidence of infant mortality from mothers with pre-eclampsia occurs in nulliparous parity status although there is no statistically significant relationship.

This study has several limitations because it is done retrospectively such as some data relating to maternal preeclampsia conditions such as income, increased maternal weight during pregnancy, or other diseases that can worsen the condition of preeclampsia.

The results of this study have implications for policies related to health interventions and treatment of women with preeclampsia, maternal complications, and complications in infants. This study has limitations, the severity of preeclampsia is still not differentiated and several other factors such as antenatal care visits, knowledge, and accompanying complications have not been measured. So it needs further study of these factors related to the incidence of infant mortality from mothers with preeclampsia.

CONCLUSION

Preeclampsia can threaten the mother and baby and can increase morbidity and mortality in infants. Factors that contribute to infant mortality from mothers with preeclampsia are maternal age, maternal gestational age, and maternal delivery method. The need for early antenatal care needs to be conveyed to pregnant women in order to screen crews for risk of preeclampsia and prevent worsening of the disease.

RECOMMENDATION

Preeclampsia is a preventable medical condition. Early pregnancy screening early and appropriate antenatal care can reduce the risk of morbidity and mortality in infants of mothers who experience pre-eclampsia. Increasing public awareness and health workers on the prevention of pre-eclampsia needs to be done through health education or including pre-eclampsia screening at standard examinations in pregnant women.

Ethical Clearance: This research has received ethical approval from the ethics committee of the general hospital health research area of Dr. Soetomo Surabaya number 0171 / KEPK / IV / 2018.

Conflict of Interest: None

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Elderly Immunity Improvement after Getting Sinbiotic and Zinc Combinations

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ABSTRACT

Elderly is one group of people who have a risk of changing immune function. Changes in immune function in the elderly, especially in the immune system mediated by cells. In accordance with the increase in age, the elderly immune system decreases the immune response against infectious and non-infectious diseases. Based on this, it is easy for the elderly to develop diseases such as infectious diseases, hypertension, coronary heart disease, cancer, autoimmune diseases, and other chronic diseases. The increasing number of elderly people is one indicator of the success of development as well as a challenge in development. The purpose of this study was to analyze the improvement of elderly immunity after getting synbiotics and zinc. The type of this research was an experimental study in which volunteers were given zinc + synbiotic combination supplements. Further measurements of IL-2, IFN-γ and IL-10 were carried out. Furthermore, the measurement results were compared to find out the differences in elderly immune expression. Analysis of normality and homogeneity to determine parametric or non-parametric statistical tests with the Shapiro-Wilk test if it meets parametric requirements then the analysis used in this study was t-test to evaluate the effect of supplementation (pre-post test). The results showed that synbiotic + zinc combination supplementation could potentially increase IL-2 profile ($p = 0.000$), IFN-γ ($p = 0.019$), and IL-10 ($p = 0.010$) significantly in the elderly. Based on the results, it could be concluded that synbiotic + zinc combination supplementation has the potential to increase IL-2, IFN-γ, and IL-10 profiles in the elderly.

***Keywords**: Zinc and synbiotic combination, Immune, IL-2, IFN-γ, IL-10*

INTRODUCTION

There has been a major population explosion at this time, according to the statistics center, namely in 2004 of 16,522,311 and while in 2020 it was predicted that the number of elderly would increase by 28 million. This is a very large amount so that if no efforts are made to increase elderly welfare since now it will cause problems and could be a big problem in the future. The tendency of this problem to occur is also marked by the figure of elderly dependence according to the 2008 BPS Susenas of 13.72%. The population dependency rate will be high and felt by the population of productive age if it is coupled with the dependency of the population aged less than 15 years, where currently the population is less than 15 years of 29.13% [(1)]

According to the results of the Basic Health Research in 2007 showed that urban elderly showed morbidity rates of 27.42, rural elderly at 33.35 and urban and rural morbidity rates of 31.11. These data shows the tendency of morbidity in the elderly has increased from year to year. The most common elderly sufferers are joint disorders followed by hypertension, cataracts, stroke, mental emotional disorders, heart disease and diabetes mellitus. Besides that, the cause of death at the age of 65 years and over in men is stroke (20.6%), chronic lower respiratory tract disease (10.5%), pulmonary

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tuberculosis (TB) (8.9%), hypertension (7.7%), NEC (7.0%), ischemic heart disease (6.9%), other heart disease (5.9%), diabetes mellitus (4.9%), liver disease (4.4%) and pneumonia (3.8%). While for women the most cause of death was stroke (24.4%), hypertension (11.2%), NEC (9.6%), chronic lower respiratory tract disease (6.6%), diabetes mellitus (6.0%), ischemic heart disease (6.0%), other heart diseases (5.9%), TB (5.6%), pneumonia (3.0%) and liver disease (2.2%) [2]. This condition certainly must get the attention of various parties. Aging people who are sick will become a burden for families, communities and even the government, so that it will become a burden in development [3].

A number of studies have shown that the prevalence of malnutrition in the elderly is very high and is often only realized when the elderly must be hospitalized [4]. A study in Jakarta showed that about two-thirds of elderly people suffer from thiamine deficiency[5]. Immune function also decreases with age, resulting in increased incidence of infectious and malignant (cancer) diseases. Research on immune function in the elderly introduces a thought that the immune system in the elderly has specific characteristics, the immune system will not only decrease with increasing age, but immune system regulation disorders will be more progressive throughout its life [6]. Initial changes occur in the cellular immune system compared to humoral, immune system evolution associated with decreased thymus function. Nutritional factors play an important role in the immune response in a healthy elderly, one of which is zinc.

Food substrates reach the large intestine can affect the composition and activity of bacteria present through fermentation of capacity in the elderly. Metabolic products from intestinal bacteria can affect the immune system. Modulation of intestinal microflora by diet is the basis for the concept of probiotics [8] and prebiotics [7].

This study analyzed the effect of synbiotic supplementation, zinc and synbiotic and zinc combinations on immune responses with IL-2, IFN-γ and IL-10 markers in the elderly [9]. The role of the immune system in the elderly is the importance of increasing IL-2 levels as cytokines for T lymphocyte proliferation, IFN-γ is a proinflammatory cytokine and IL-10 as an antiinflammatory cytokine against immune response, then this study will focus on "Enhancing Elderly Immunity After Getting Sinbiotic and Zinc combination".

MATERIALS AND METHOD

This study aimed to find facts about the function of synbiotic supplementation and zinc on the immune response at the same time can be implemented in a national program for enhancing immunity for guests. This research was conducted in 2016 in the Mangasa Health Center working area of Health Office of Makassar City, South Sulawesi Province, Indonesia. The main sources needed in this study were: 1) serum, obtained from blood, 2) ELISA [10] to measure levels of IL-2, IFN-γ and IL-10 which was carried out in the Laboratory of the Hasanuddin University Hospital of Education, Makassar, Indonesia, 3) research subjects were > 60 years old, Makassar tribe, having no history of infectious and degenerative diseases based on doctor's recommendations, so the sample size of 36 people was divided into 3 groups.

This effective method was proven by implementing several steps: 1) measuring instrument validation (ELISA test) by comparing the results of laboratory tests to measure and the accuracy of the measuring instrument to be used, 2) measuring blood serum using the ELISA test before and after getting synbiotics and zinc for 3 months, 3) measured levels of IL-2, IFN-γ and IL-10 by taking ± 5 cc of blood, 4) comparing measurement results before and after synbiotic supplements and zinc to determine elevated levels of IL-2, IFN- γ and IL-10.

FINDINGS

Effect of Zinc - Sinbiotic combination supplementation on the variables of IFN-γ, IL-2, and IL-10 in the elderly

Table 1. Different Test Results between Variable Zinc + Sinbiotic Supplementation Groups IFN-γ, IL-2, and IL-10

Variable	Zinc-Sinbiotic Combination Supplementation					P-value of T-Test
	Min	Max	Mean	Standard Deviation	Median	
IFN-γ	50.11	519.85	179.05	116.23	154.65	0.019
IL-2	412.63	1036.35	734.64	205.21	708.98	0.000
IL-10	72.95	232.12	146.29	50.76	133.63	0.010

Table 1 shows that there was a significant effect of zink-synbiotic combination supplementation on all four cytokine profiles ($p < 0.05$).

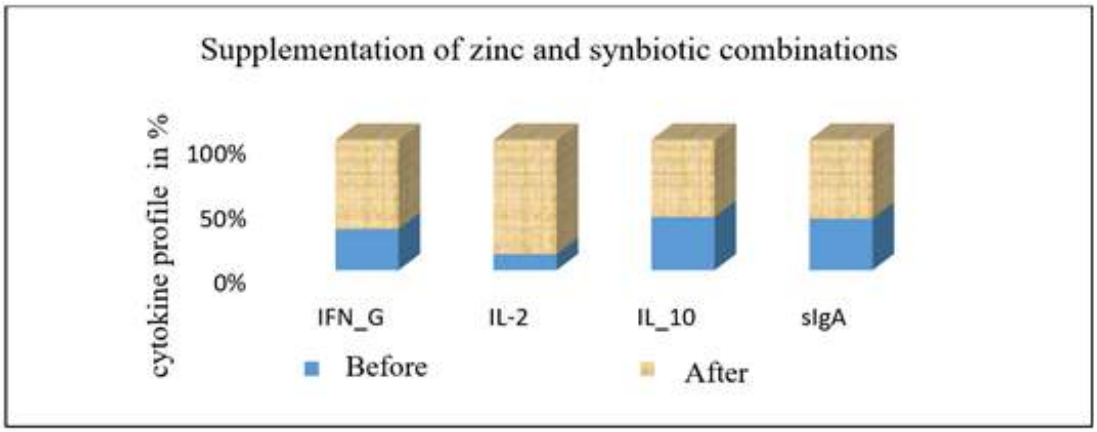

Figure 1. Average of Cytokine Profile in Supplementation of Zinc + Sinbiotic Group

Figure 1 shows that in the zinc + sinbiotic supplementation group the highest increase in IL-2 profile before and after zinc + synbiotic supplementation was given. Non-varying increases in IL-10 profiles.

The effects of synbitoic and zinc combination supplementation found scientific evidence that the immune response in the elderly for all variables had been increased previously and after the provision of synbiotic and zinc supplements.This synbiotic and zinc supplementation can be implemented and useful in a national program for enhancing immunity for the elderly

DISCUSSION

The results of the study on elderly after zinc + sinbiotic treatment showed that there was a significant increase in IFN-γ, IL-2, IL-10 and sIgA, this meant that there was a balance / homeostasis between Th1 and Th2. This is because zinc has one function for IFN--expression in T cells [(11)]. Therefore the mechanism of action of the synbiotic will be corrected by the presence of zinc in the IFN-γ expression in T cells.

The synbiotic role in modulating the immune response of the elderly by influencing the maturation of dendritic cells. APC in this case is a dendritic cell which is a determinant of Th1 / Th2 balance and development of tolerance. Several types of dendritic cells that can direct the immune response according to the activation environment or kinetic activation [(12)]. Inhibition of maturation of dendritic cells in turn leads to a reduction in pro-inflammatory cytokines of interferon gamma (IFNγ), IL-4 and IL-5 from T cells. IL-10 also inhibits the production of other inflammatory mediators such as IL-1 and tumor necrosis alpha factor (TNF) by macrophages. In naive CD4 + T cells, IL-10 inhibits CD28 signaling rendering these cells can properly activate. IL-10 is not always inhibitory, it can also promote B cell activation and stimulate NK cell proliferation. When IL-10 is produced and secreted, acts specifically on IL-10 receptors, a structure consisting of two subunits; IL-10 receptor 1 and IL-10 receptor 2. After binding to cytokines, the receptor subunit is associated with signal transduction molecules in the cytoplasm of cells expressing receptors, encouraging signals that primarily inhibit the activity of some of the

genes needed to produce an immune response, but can also promote activation of some specific target cells as mentioned above.

CONCLUSION

Based on the results of the study it can be concluded that both synbiotic and zinc supplementation are even symbiotic and zinc combinations to increase the profile of IL-2, IL-10 IFN- γ. Therefore it is recommended to use zinc supplements as immunomodulators on things that cause Th1 and Th2 immunity in the elderly to stay healthy and do the same research but check serum zinc levels in the elderly (sample).

Conflict-of-Interest Statement : In this study there was no conflict of interest.

Source of Funding : The source of funding comes from the Research of Development of Health Workers of the Makassar Health Polytechnic (the fund for operational costs of state universities)

Ethical Clearance : Research ethics was obtained after the researcher made a presentation in front of the Ethics Committee of Faculty of Public Health, Airlangga University and had received a certificate with the number 525-KEPK.

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The Prevalence of Depression in Primary Health Care Centers in Iraq

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ABSTRACT

Background: The prevalence of depressive symptoms is more frequent among patients than in the general population. Little is known about the prevalence rate of depressive symptoms in Iraqi patients attending primary health centers, in addition there under diagnosis and under estimation of depressive symptoms in clinical settings.

Aim of the study: The aim was to estimate the prevalence of depressive disorders among Iraqi patients.

Patients and Method: A cross sectional study involving a cohort of Iraqi patients attending primary health center. Patients were selected in a systemic random way from the population of patients already visiting the primary health care center aiming at a target of at least 100 patients. Any patient visiting the primary health center was included in the current without previous limitations with respect to age or gender. Any patient who was already diagnosed by a specialist to have depressive disorder was excluded from this study. The study was carried out at Al-Saniyah primary health center.

Results: There were 17 (17.3%), 7 (7.1%) and 3 (3.1%) patients with mild, moderate and severe depression. Patients with depression were significantly older than patients without depression, 37.26 ± 8.88 years versus 31.26 ± 10.49 years, respectively and the level of significance was (P = 0.045). Moreover, it was observed that the rate of depression across age intervals was significantly non-homogenous, with the highest rate being encountered in patients older than 40.

Conclusion: The rate of depressive disorders among patients attending primary health care centers is higher than that of the general population.

Keywords: *Depression, primary health care center, Iraq*

INTRODUCTION

Depressive disorders are common with a prevalence rate of 5-10% in primary care centers [(1)]. The majority of patients will present to primary health care centers with problems other than low mood [(2)]. The diagnosis of depression will reside of eliciting of core and other symptoms. The criteria for diagnosis are: Symptoms must present for at least 2 weeks and represent a change from normal; symptoms are not secondary to the effect of drugs, alcohol misuse, medication or medical intervention; symptoms may cause significant distress and/ or impairment of social, occupational, or general function. Core symptoms include: depressed mood, anhedonia" diminished interest or pleasure in all, or almost all activities most of the day", weight change of more than 5% of body weight in a month, sleep disturbance "insomnia or hypersomnia", psychomotor agitation or retardation observable by others, fatigue, or

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loss of energy or reduced libido, feeling of worthlessness or excessive or inappropriate guilt, diminished ability to think or to concentrate or indecisiveness, recurrent thoughts of death or suicide [3]. The prevalence of depressive symptoms is more frequent among patients than in the general population [4]. There is psychoneuro-immunology connection between chronic illnesses and depression [5]. Little is known about the prevalence rate of depressive symptoms in Iraqi patients attending primary health centers, in addition there under diagnosis and under estimation of depressive symptoms in clinical settings. For that reason, this study was designed and carried out at the department of Family medicine and Community medicine in the faculty of medicine/ Al-Qadisiyah University.

PATIENTS AND METHOD

The study was designed to be a cross sectional study involving a cohort of Iraqi patients attending primary health center. Patients were selected in a systemic random way from the population of patients already visiting the primary health care center aiming at a target of at least 100 patients during the short period of this study. Any patient visiting the primary health center was included in the current without previous limitations with respect to age or gender. Any patient who was already diagnosed by a specialist to have depressive disorder was excluded from this study. The study was carried out at Al-Saniyah primary health center. The beginning of data collection was dated on the 10th January 2018 and ended on the 1st may 2018. A total of 140 days was the length of the period required to collect data from involved patients. The questionnaire form was based on the following: International (ICD-10) diagnostic check list for the diagnosis of depressive symptoms [6], Beck depressive inventory-II to measure the severity of depression, Sociodemographic data including age, gender, residency, address, occupation, education level and income in addition to any chronic medical illness. Data were collected, summarized, analyzed and presented using two software programs; these were the Statistical package for social sciences (SPSS) version 23 and Microsoft Office excel 2013. Numeric variables were presented as mean, standard deviation (SD) and range, whereas, categorical variables were expressed as number and percentage. Prevalence rate of depression was expressed as percentage. Association between categorical variables was assessed using either Chi-Square test or Yates correction for continuity when more than 20% of cells have expected counts less than 5. Comparison of mean values between three groups was done using one way analysis of variance (ANOVA). The level of significance was considered at $P \leq 0.05$.

RESULTS

1.Sociodemographic Characteristics Of The Study Sample

The current study included 98 patients, 48 (49.0%) males and 50 (51.0%) females. The mean age of patients was 33.22 ±14.76 years and it ranged from 13-65 years. According to marital status, there were 68 (69.4%), 23 (23.5%), 5 (5.1%) and 2 (2.0%), married, single, widowed and divorced patients respectively. According to level of education, the study included 20 (20.4%), 32 (32.7%), 21 (21.4%) and 25 (25.5%), illiterate, primary, secondary and higher education patients respectively. All patients were from Al-Sahiyah district. With respect to occupation, patients were distributed as 38 (38.8%), 14 (14.3%), 21 (21.4%), 19 (19.4%), 4 (4.1%) and 2 (2.0%), housewives, student, free worker, employee, military and retired respectively. Economically speaking, the study included 49 (50.0%), 46 (46.9%) and 3 (3.1%) patients of poor, moderate and good income respectively. The study, included 7 (7.1 %), 3 (3.1 %), 1 (1.0 %) and 1 (1.0 %) patients with hypertension, diabetes mellitus, post-partum hemorrhage and psychiatric illness respectively.

2.Prevalence Rate And Level Of Depressive Disorders

Out of 98 patients participating in the current study, 27 (27.6%) fulfilled the criteria of a diagnosis of depressive disorders. There were 17 (17.3%), 7 (7.1%) and 3 (3.1%) patients with mild, moderate and severe depression.

3.Correlation Between Age And Rate Of Depression

A significant difference in mean age of patients with and without depression was observed in the present study. Patients with depression were significantly older than patients without depression, 37.26 ± 8.88 years versus 31.26 ± 10.49 years, respectively and the level of significance was (P = 0.045), as shown in figure 2. Moreover, it was observed that the rate of depression across age intervals was significantly non-homogenous,

with the highest rate being encountered in patients older than 40 years of age (40.7%) (*P*=0.044); however, there was no significant difference in mean age among patients with mild, moderate and severe depression respectively (*P* = 0.432).

4.Association Between Depression Rate And Gender

The rate of depression among male patients was (22.9%), whereas, among female patients it was (32.0%). Although, rate of depression was slightly higher in female patients compared to male patients, the difference was not statistically significant (P = 0.314), as shown in table 4.

Table 1: Association between depression rate and gender

Gender	*n*	%	*P**	Mild	Moderate	Severe
Male (n = 48)	11	22.9	0.314 Not significant	8 (16.7%)	3 (6.3%)	0 (0.0%)
Female (n = 50)	16	32.0		9 (18.0%)	4 (8.0%)	3 (6.0%)

n: number of cases; *Chi-Square test

5.Association Between Depression Rate And Marital Status

Rate of depression according to marital status was as following: 26.5%, 26.1%, 60.0% and 0.0% among married, single, widowed and divorced patients, respectively. Despite some differences in rate of depression among patients with respect to marital status, there was no statistical significance, (*P* > 0.05), as shown in table 2.

Table 2: Association between depression rate and marital status

Marital status	*n*	%	*P*	Mild	Moderate	Severe
Married (n = 68)	18	26.5	0.719* NS	12 (17.6%)	4 (5.9%)	2 (2.9%)
Single (n = 23)	6	26.1	0.857* NS	3 (13.0%)	3 (13.0%)	0 (0.0%)
Widowed (n = 5)	3	60.0	0.249† NS	2 (40%)	0 (0.0%)	1 (20.0%)
Divorced (n = 2)	0	0.0	0.935† NS	0 (0.0%)	0 (0.0%)	0 (0.0%)

n: number of cases; *Chi-Square test; † Yates correction for continuity; NS: not significant

6. Association Between Depression Rate And Education Level

The rate of depression according to education level was as following: 35.0%, 25.0%, 28.6% and 24.0% in patients who are illiterate, with primary, secondary and with higher level of education respectively. The rate of depression rate in illiterate patients was the highest; however, no group showed statistically significant difference than other groups (P > 0.05), as shown in table 3.

Table 3: Association between depression rate and education

Education	*n*	%	*P* *	Mild	Moderate	Severe
Illiterate	7	35.0	0.403 NS	5 (25.0%)	0 (0.0%)	2 (10.0%)
Primary	8	25.0	0.694 NS	5 (15.6%)	2 (6.3%)	1 (3.1%)
Secondary	6	28.6	0.783 NS	4 (19.0%)	2 (9.5%)	0 (0.0%)
Higher education	6	24.0	0.645 NS	3 (12.0%)	3 (12.0%)	0 (0.0%)

n: number of cases; *Chi-Square test; NS: not significant

7. Association Between Depression Rate And Occupation

The rate of depression according to occupation was as following: 29.0 %, 35.7 %, 23.8 %, 15.7 %, 25.0 % and 100.0% in housewives, student, free worker, employee, military and retired respectively. The rate of depression rate showed differences according to occupation; however, no group showed statistically significant difference than other groups (P > 0.05).

8. Association Between Depression Rate And Income

The rate of depression according to income was as following: 34.7 %, 21.7 % and 0.0 % in patients with poor, moderate and good income respectively. Despite the fact that patients with good income reported 0.0% rate of depression, there was no statistical significance among groups (P > 0.05), as shown in table 4.

Table 4: Association between depression rate and income

Income	*n*	%	*P**	Mild	Moderate	Severe
Poor (*n* = 49)	17	34.7	0.113 NS	11 (22.4%)	4 (8.2%)	2 (4.1%)
Moderate (*n* = 46)	10	21.7	0.226 NS	6 (13.0%)	3 (6.5%)	1 (2.2%)
Good (*n* = 3)	0	0.0	0.668 NS	0 (0.0%)	0 (0.0%)	0 (0.0%)

n: number of cases; *Chi-Square test; NS: not significant

9. Association Between Depression Rate And Other Medical Problem

The rate of depression among patients with chronic illnesses was significantly higher than that in patients without chronic medical illnesses, 75.0 % versus 26.5 % (P <0.001), as shown in table 10. The risk of having depression, in terms of Odds ratio, in patients with chronic medical illnesses was 10.83 folds than patients without chronic medical illnesses and the 95% confidence interval was (2.65 to 44.24). The etiologic contribution, measured by etiologic fraction, of depression to chronic medical illnesses was 0.68, as shown in table 5. The severity of depression in patients with chronic illnesses is shown in table 6.

Table 5: Association between depression rate and other medical problem

Other medical problem	Patients with depression *n* = 27	Patients with no depression *n* = 71	*P*†	*OR*	*95% CI*	*EF*
Positive (*n* = 12)	9 (75.0%)	3 (25%)	<0.001 HS	10.83	2.65- 44.24	0.68
Negative (*n* = 68)	18 (26.5%)	68 (73.5%)				

n: number of cases; † Yates correction for continuity; HS: highly significant; OR: Odds Ratio; CI: confidence interval

Table 6: Level of depression according to medical illness

Levels of depression	Number of patients with medical illness	%
Mild (*n* = 17)	5	29.4
Moderate (*n* = 7)	2	28.6
Severe (*n* = 3)	2	66.7
Total (*n* = 27)	9	33.3

DISCUSSION

The estimated prevalence rate of depression in primary health center, in the present study, of 27.6% seems relatively high. It has been stated in published literatures that mental disorders are more common in clinical than in community settings, one study in Kenya found that up to 40% of the patients in general medical and surgical wards were depressed and required treatment [(7).] Prevalence of depression was 30.3%. Direct comparison of prevalence studies for depressive disorders is difficult because of a lack of uniformity as studies differ in terms of culture, patient population, socio-demographic factors, diagnostic instrument, and methodology [(8)] . Given these limitations, the prevalence figures determined in this study are consistent with most findings reported elsewhere. The Prevalence of depression found in the present study (30.3%) was significant and in keeping with the results from both developed and developing countries. For instance, the results were congruous with the prevalence rate of 29.6% reported among Kuwait PHC patients [(9)]; the 29.2% reported in primary care setting in Thailand [(10)]; the 28.4% reported among primary care attendees in South India [(11)]. Interestingly the prevalence is somehow similar to that of the international study [(12)] where the prevalence was 33.5%, the 31.6% prevalence rate of current major depressive episode at PHC centers in Uganda [(13)], and also the 32% prevalence rate of depressive disorder at a Community Health Centre in South Africa [(8)]. In one study, the prevalence of depression among the patients attending the outpatients department was found to be 30.3%, which is approximately similar to that found in the present study[(2)]. Despite this evidence that depression contribute a significant percentage of disease burden in the clinical setting there is also evidence which indicates that depression often goes unrecognized [(14)]. World Health Organization report on mental health suggest that undiagnosed depression places a significant socio-economic burden on individuals, families and communities, in terms of increased service needs, lost employment, reduced productivity, poor parental care with the risk of transgenerational effects and an increased

burden on care givers [15]. Although depression-related health problems are estimated to be huge, a gap in the provision of services has been highlighted by various studies [16]. The problem is said to be even more serious in settings that are already labouring under the burden of inadequate resources and shortage of health care personnel [17]. Delays, misdiagnosis and non-specific treatments have been typical pathways to care for people with depression [18]. It is evident that delays in seeking treatment, misdiagnosis and non-specific treatments have compromised appropriate care for people with depression hence depression is among the leading causes of disability in the world and cause of years of health lost to disease in both men and women [19].

Conclusion: The rate of depressive disorders among patients attending primary health care centers is higher than that of the general population.

Conflicts of Interest: There is no conflicts of interest.

Source of funding- Self

Ethical Clearance: The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/ have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity.

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The Rate of Thyroid Tumor among Patients with Goiter Referred to Al-Diwaniyah Teaching Hospital

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ABSTRACT

Background: The thyroid cancer is the most frequent cancer of the endocrine system, and it is rapidly increasing in incidence . It occur more often in people who live in areas with excessive exposure to radiation and excessive use of x-ray which can be considered as an important risk factors . thus the aim of present study is to evaluate the prevalence and possible risk factors of thyroid cancer among patients with goiter that are referred to Al-Diwaniyah teaching hospital.

Patients and method : About 74 patients (19 male ,55 female) with goiter have been selected (33 solitary nodule, 41 MNG),with ages of more than 5 years .We evaluate them by history ,examination and investigations, reporting presence or absence of cancer ,and also the. History includes the most important questionnaires (family history ,exposure to radiation especially x-ray).

Results : The most frequent ages presented with goiter are between 45-60 year ,female represented 74.3% of patients, with 55.4% of patients presented with MNG and 44.6% presented with solitary nodule. Family history of goiter was positive in 24.4% and negative in 75.6% of patients .History of x-ray exposure were positive in 59.4% and negative in 40.6% of patients. histological results reveal that the papillary cancer represent 14.8% and the follicular cancer represent 6.7% of all patients with goiter.

Conclusion : The positive family history and the history of x-ray exposure are important risk factors.

Keyword: *Thyroid cancer, Goiter, X-ray.*

INTRODUCTION

The thyroid gland is an endocrine gland of a butterfly shape located in the lower front of the neck. The job of the thyroid is the synthesis of thyroid hormones which are responsible for the metabolism in the body. [(1).] Endemic goiter is the presence of goiter in more than 10 % of the population [(2)]. Iraq is an endemic area with goiter [(3)]. Thyroid cancer is the most common malignancy of endocrine system and it rises in the incidence. The increasing incidence is due to early detection of asymptomatic small cancer[(4)]. Most of thyroid cancers show an indolent phenotype and have a very good prognosis with survival rates of > 95% at 20 years but the recurrence or persistence rate remain elevated [(5)]. The incidence of thyroid cancer is about 3-4 times higher among women than men (6th cancer in women).It occurs at any age but it is rare in children. Most tumors are diagnosed during 3rd -6th decade of age[(6)]. The thyroid cancer in Iraq represents the 2nd cancer in women and the 8th cancer in men [(7)].Thyroid cancer is arise from either follicular or non-follicular cells. Follicular type includes papillary (PTC), follicular (FTC), poorly differentiated and undifferentiated(anaplastic) thyroid carcinoma (ATC). PTC and FTC are the most common types and both called differentiated thyroid cancer (DTC). Medullary thyroid carcinoma (MTC) arises from calcitonin-producing cells (C cells)[(8)].The risk factors of thyroid cancer are include Radiation Which is the most important risk factor. [(9)], TSH Levels and Iodine

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deficiency, Low level of Iodine causes an increase level of (TSH.[10], Autoimmune Thyroid disease and thyroid nodularity.[11], Environmental and ionizing radiation and dietary iodine consumption [12], Familial or genetic [13,14], and finally Cowden's syndrome [15].

PATIENTS AND METHOD

After we take a permission from ethics committee of Al Qadisiyah university of medical science, 74 Iraqi patients randomly selected, are involved in this study, at the duration from April,2018 to June,2018, in Al Diwanyah teaching hospital which is the major referral hospital in our city. It is a prospective randomly selected cross sectional study to determine the prevalence of thyroid cancer among patients with goiter referred to Diwanyah Teaching hospital

Important questionnaires used for data collection, including : Name , Age, Sex, duration of illness , family history of thyroid diseases, and the history of x-ray exposure. Physical examination including : Solitary nodule or MNG ,size of goiter ,consistency (firm, hard) and retrosternal extension. Laboratory investigation also done in form of : Routine laboratory investigation like :CBC, LFT,RFT (as a preparation for surgery). T3,T4 ,TSH .Other data collected after surgery(type of surgery and the results of histopathology)

A total of 74 patients with goiter was included in this study (19 male and 55 female),their ages are more than 5 years ,with the most frequent ages are between 45-60year. All patients were sent to Al Diwanyah hospital lab for investigation, but the biopsies were sent to a private lab. Examination of goiter done for all patients which consist of inspection and palpation . Statistical analysis: Data has been collect and encompassed in a data grounded system and examined by statistical set of community knowledge ((SPSS, Inc., Chicago, IL, USA)) version 20. Non-parametric data has been expressed as percentages such as male and female, type of goiter. were analyzed using chi square like in comparison between the types of goiter and its consistence . Significance was set at the $P \leq 0.05$ level in all analyses.

RESULTS

Table 1. Gender of patients who are presented with goiter and the percentages of them.

		NO.	Percent
Gender	male	19	25.7
	female	55	74.3
	Total	74	

Table 2. The age groups of patients with goiter.

Age groups	No.	percent
5-14 y	11	15%
15-44 y	15	20%
45-60 y	35	47%
Above 60 years	13	18%
Total	74	100

Table 3. Numbers and percentages of solitary and MNG . MNG is more frequent.

	No.	Percent
solitary	33	44.6
MNG	41	55.4
Total	74	100.0

Table 4.Numbers and percentages of each type of thyroid carcinoma (papillary , follicular) from the total number of patients with goiter (74) and from the number of patients with cancer (16). The rate of thyroid tumors was 21.6 .

	No.	**Percent**
Papillary carcinoma	11	14.8% from 74 68% from 16
Follicular carcinoma	5	6.7% from 74 32% from 16
Total	16	21.6% from 74

Table 5. The significance of x-ray exposure in the development of thyroid cancer .X-ray is a significant risk factor due to that the P value is <0.05 .

	x-ray exposure			p-value
	Positive	Negative	Total	
Malignant	14(87.5%)	2(12.5%)	16	0.02

Table 6. The significance of the presence of positive family history of thyroid cancer in the development of it . Family history is a significant risk factor as the P value is <0.05 .

	Family history of thyroid cancer			
	Positive	Negative	Total	
Malignant	10(62.5%)	6(37.5%)	16	0.001

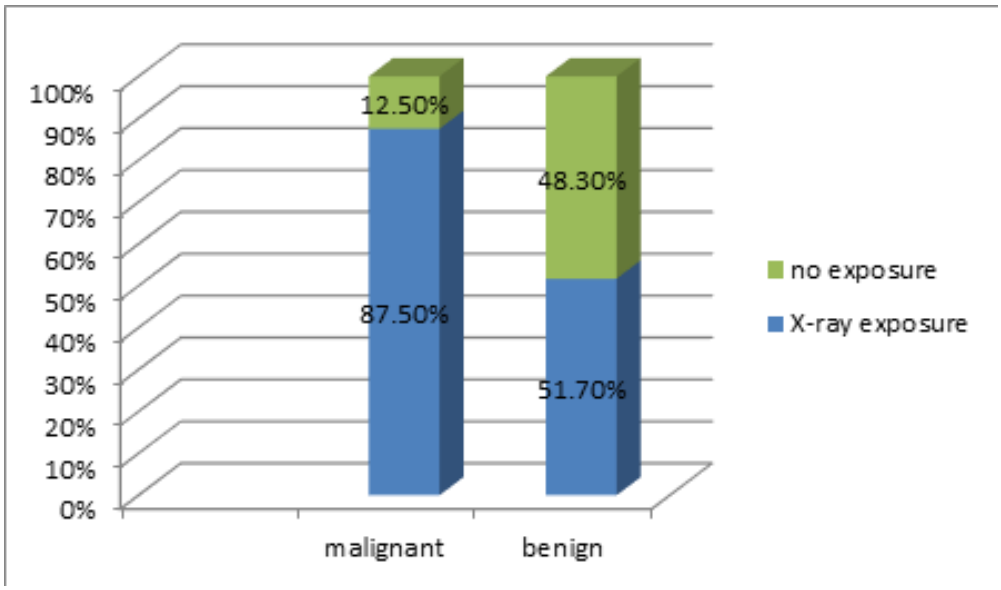

Figure 1: . The significance of x-ray exposure in the development of thyroid cancer .

DISCUSSION

The major concern in patients presenting with thyroid enlargement is to rule out the possibility of neoplastic disease .In our study we found that females patients with goiter are predominant, 74.3% female, 25.7% male (Table 1), which goes with study in Hilla city in which 75% of patients was females [16] . In our study the mean age of patients was 43.7 year . This is less than that reported by Al Katib[16] (48 year), and more than that reported by Yasser A. (38.4 year) [17]. The commonest ages at presentation were (45-60 years) (Table 2), while other study by Al- Katib reported that most of the patients were in the range of (31-40 years). [16]

Our result found 44.6% of goiter presented as solitary and 55.4% as MNG (Table 3), these result consisted with result by Albasri 2014 in Saudi Arabia (58% MNG) [18] . In our study thyroid tumor rate was 21.6% from patients with goiter (Table 4). female were predominant in malignancy 68% and male 32% these result consisted with study in Babylon city were female 72% of malignant patients[16]. The frequency of malignancy was higher in Solitary (27%) as compared to MNG (17%) and the same results was in study by Anwar et al 24% [19].

The commonest type of cancer in our patients was PTC(68% from patients with cancer, 14.8% from patients with goiter) ,followed by FTC(32% from

patients with cancer, 6.7% from patients with goiter) (Table 4) other study with the same results done by Al-Katib A.2009 in Babylon 60% [16]. In our findings there was a positive association between patient who have malignancy with X-ray exposure and radiation (Table 5) similar result reported by study down in Kuwait demonstrate that there is association of Dental X-rays with thyroid cancer[20] .

Other findings noted that malignancy is more prevalent in those with family history of thyroid tumor (Table 6). Another study from Kuwait conducted in 2006 reported an association between family history of benign thyroid disease and thyroid cancer [23] ,also the rate of PTC and the cancer of colon among families occur due to familial adenomatous polyposis . The incidence of FTC and breast cancer is higher among patients with Cowden disease [20].

CONCLUSIONS

Thyroid cancer is common among patients with goiter in our region . The most frequent ages that presented with goiter are between 45-60 year with female predominance . The most common type of goiter was MNG fallowed by solitary nodule. Family history of thyroid cancer was positive in 62.5% of patients with thyroid cancer .X-ray exposure was positive in 87.5% of thyroid cancer patients . In our study, the x-ray and family history are significant risk factors . The papillary thyroid carcinoma is more common than follicular thyroid carcinoma among patients with goiter.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/ have given his/her/ their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity.

Conflicts of Interest: There are no conflicts of interest.

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Missed Opportunities for Immunization among Young Children in Baghdad/AlKarkh

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ABSTRACT

Background: Immunization is one of the most cost-effective public health interventions aiming at reducing infectious diseases morbidity and mortality. The national immunization coverage rates are still below the target levels. Missed opportunities for immunization (MOI) are considered as one of the most preventable factors affecting vaccination coverage. This study aimed to estimate the proportion of missed opportunities for immunization among young children attending primary health care centers (PHCCs) in Baghdad/Al-Karkh and determine factors associated with them. **Method:** This is a cross-sectional survey involved a health facility exit interview of companions of children up to 2 years of age. The study conducted in randomly selected primary health care centers in Baghdad/AlKarkh. **Results:** Of the eligible children under two years of age exited the primary health care centers, 36.4% had missed opportunities. The highest single vaccine missed opportunities was for measles vaccine followed by BCG vaccine. Child's age and sex, the purpose of visit to the facility, companion's education and occupation, and possession of the vaccination card at the visit day were found to be significantly associated with MOI. **Conclusion:** Our findings indicate a presence of a coverage gap in vaccination.

Keyword: *Immunization, Missed opportunities for immunization.*

INTRODUCTION

Immunization is one of the most cost-effective public health interventions, with confirmed strategies that make it attainable to even the hardest–to–reach and vulnerable people.[1] Since 1974, the World Health Organization (WHO) adopted an action plan called the Expanded Program on Immunization (EPI) whose main objective is to minimize morbidity and mortality from vaccine-preventable diseases.[2] Nationally, the EPI was founded since 1985 transmitting immunization benefits to children and women of childbearing age.[3] According to the Global Vaccine Action Plan of the WHO, countries are aiming to attain immunization coverage rates for all antigens of at least 90% at the national level and at least 80% at the district level,[4] in spite of that, the coverage rates are still under the targeted levels.[5] A large number of nations have not fulfilled the EPI goals due to missed opportunity for immunization which is one of the most substantial preventable factors affecting vaccination coverage.[6] The WHO EPI Global Advisory Group states that one of the ways to increase the immunization coverage rates is to vaccinate all eligible children at each visit to a health facility.[7] MOI is defined as inability to immunize a child who seeks preventive or curative services with antigen(s) for which he/she is eligible in the absence of true contraindications.[8] This study was conducted to estimate the proportion of MOI and identify the factors associated with them among young children at primary health care centers in Baghdad/Al-Karkh.

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METHOD

This is a health system study utilizing a cross-sectional design conducted in Al-Karkh side of Baghdad, the capital of Iraq, for the assessment of missed

opportunities for immunization and factors associated with them among the study population.

A total of 40 out from 90 primary health care centers were selected from Baghdad/Al-Karkh health directorate by a multistage random sampling.

Scientific and ethical approvals of the study were obtained from the scientific and ethical committees in the ministry of health. After ensuring confidentiality and anonymity and illustrating the study purpose and importance, a verbal consent from each participant was obtained prior to data collection.

RESULTS

A total of 521 children's companions were interviewed upon their exit from primary health care centers. Two hundred seventy six of them (53.0%) had come for vaccination, 177 (34.0%) for medical consultation, and 68 (13.0%) accompanying the mother or another sibling. About 66.4% of the children were under one year of age, and 50.9% were males.

Regarding the demographic characteristics of the children's companions, most of them (82.9%) were 20-40 years of age, 89.1% were females, 86.2% were either father or mother of the child, and 96.2% were married. Concerning their educational status, 8.1% were illiterate, 2.9% can read and write, 34.5% had primary education or less, 32.4% had incomplete secondary education, 12.1% had complete secondary education, and 10.0% had more than secondary education. Most of them (83.5%) were housewives and the others were employees, self-employed, or retired.

Ninety eight percent of the companions' reported having a child vaccination card, of whom 83.5% (82.0% of the total enrolled) had brought it with them on the visit day. Of the children eligible for vaccination attending the primary health care centers, 36.4% had missed opportunities for immunization to at least one antigen, who constituted 24.0% of the total sample. The highest single vaccine missed opportunities was for measles (36.8%) followed by BCG and OPV0 (32.0%) and then Hexa3 and OPV3 (24.8%) (Table 1).

Table (1): The vaccine-specific missed opportunities.

Vaccine		Number of MOI	%
1	BCG	40	32
2	Hepatitis B, newborn dose	25	20
3	OPV 0	40	32
4	Hexavalent 1	12	9.6
5	OPV 1	12	9.6
6	Rotavirus 1	10	8
7	PCV 1	13	10.4
8	Hexavalent 2	19	15.2
9	OPV 2	19	15.2
10	Rotavirus 2	19	15.2
11	PCV 2	20	16
12	Hexavalent 3	31	24.8
13	OPV 3	31	24.8
14	PCV 3	28	22.4
15	Measles	46	36.8
16	MMR 1	17	13.6
17	Pentavalent first booster dose	9	7.2
18	OPV first booster dose	9	7.2

The most prominent reasons for missing an immunization opportunity as declared by the companions were false contraindications for immunization (33.6%), the visit day was not a vaccination day (25.6%), and failure of the health care workers to assess the child's immunization status (23.2%) (Table 2).

Table (2): Reasons for MOI.

Reasons for MOI		**n**	**%**
1	The doctor/nurse said that it could not be done because the child is sick	42	33.6
2	Today is not a vaccination day	32	25.6
3	The health worker did not assess the child's immunization status	29	23.2
4	Negative parents' experiences with vaccination	10	8
5	The doctor/nurse said that they could not open a vaccine vial for one child because this will waste the vaccine	6	4.8
6	The doctor said that he/she cannot administer simultaneously multiple antigens	2	1.6
7	The child's residence is outside the geographical area of this facility	2	1.6
8	There were no vaccines	1	0.8
9	There would have been a long wait	1	0.8
	Total	125	100

Factors associated with missed opportunities for immunization included child age (P=0.025), child sex (P=0.008), purpose of visit to the facility (P<0.001), companion's education (P=0.006), companion's occupation (P=0.012), and possession of the vaccination card (P<0.001) (tables 3 & 4).

Factors like family size, companion's age, companion's relation to the child, companion's marital status, and residence were found to be not significantly associated with MOI (P>0.05) (tables 3 & 4).

Table (3) Child's demographics.

	Missed opportunity		**No missed opportunity**		**P value**
	n=125	**100%**	**n=218**	**100%**	
Child age groups (months)					0.025*
0-11	89	71.2	178	81.7	
12-24	36	28.8	40	18.3	
Total	125	100.0	218	100.0	
Child sex					0.008*
Male	76	60.8	100	45.9	
Female	49	39.2	118	54.1	
Total	125	100.0	218	100.0	
Reasons for attending the PHC center					<0.001*
Vaccination	67	53.6	209	95.9	
For a medical consultation	44	35.2	9	4.1	
Company	14	11.2	0	0.0	
Total	125	100.0	218	100.0	
Number of people living in the home					0.559
2-5	63	50.4	117	53.7	
6 or more	62	49.6	101	46.3	
Total	125	100.0	218	100.0	
* Significant association using Pearson Chi-square test at 0.05 level.					

Table (4) The child's companions socio-demographics characteristics.

	Missed opportunity		No missed opportunity		P value
	n=125	100%	n=218	100%	
Age groups (years)					0.482
<20	3	2.4	13	6.0	
20-39	102	81.6	174	79.8	
40-59	18	14.4	27	12.4	
≥60	2	1.6	4	1.8	
Total	125	100.0	218	100.0	
Relation to the child					0.404
Mother/Father	105	84.0	183	83.9	
Grandparent	20	16.0	32	14.7	
Uncle/Aunt	0	0.0	3	1.4	
Total	125	100.0	218	100.0	
Marital status					0.658
Married	120	96.0	207	95.0	
Widowed	5	4.0	11	5.0	
Total	125	100.0	218	100.0	
Schooling					0.006*
Illiterate	22	17.6	15	6.9	
Read and write	5	4.0	10	4.6	
Primary or less	48	38.4	75	34.4	
Incomplete secondary	35	28.0	61	28.0	
Complete secondary	8	6.4	29	13.3	
More than secondary	7	5.6	28	12.8	
Total	125	100.0	218	100.0	
Occupation					0.012*
Housewife	118	94.4	178	81.7	
Employee or laborer	3	2.4	18	8.3	
Self-employed	3	2.4	18	8.3	
Retired	1	0.8	4	1.8	
Total	125	100.0	218	100.0	
Having the child's vaccination card					<0.001*
Children who have vaccination card and brought it with them	97	77.6	217	99.5	
Children who have vaccination card but not brought it with them	19	15.2	1	0.5	
Children who do not have vaccination card at all	9	7.2	0	0.0	
Total	125	100.0	218	100.0	
Residence lies in the same municipality of the PHC center					0.249
Yes	117	93.6	210	96.3	
No	8	6.4	8	3.7	
Total	125	100.0	218	100.0	

* Significant association using Pearson Chi-square test at 0.05 level.

DISCUSSION

The overall rate of MOI in this study was 36.4%. Compared to previous studies, this was close to rates found in Egypt (30%), Sudan (35%), India (35.7%), Yemen (38%), and Nigeria (39.1%).[9-13] However, it was higher than findings in Kenya (16.2%), South Africa (4.6%), Kingdom of Saudi Arabia (12%), Argentine (19.8%), and Mozambique (20.6%).[6, 14-17] Conversely, our finding was lower than findings in the Dominican Republic (43.8%), the Philippines (50%), Swaziland (54%), and South Sudan (56.5%).[18-21] This variation in the prevalence of MOI could be due to; difference in sample sizes and sampling techniques.

The current study showed that the commonest vaccine missed was the measles vaccine (36.8%). This high rate indicates that our population might be at high risk of measles outbreaks. This finding agreed with findings of other researchers.[13, 21-24]

The most distinguished reason for MOI by the children's companions was the health care workers' false contraindications (33.6%). This result agreed with the findings of many studies.[24-33]

About 25.6% of the companions attributed the MOI to that the visit to the PHCC did not occur on an immunization day. This finding is compatible with that found by Al-Shehri S.N. *et al,* Mitra & Manna, and Verma *et al*[15, 34, 35]

This study showed that children aged 12-24 months are more prone to MOI than younger ones (P=0.025). This agreed with the results of other studies.[18, 21, 36] This may be attributed to the long interval between the vaccines in the first year of life and those in the second year,. However, Assefa[37] stated that younger children are more likely to have MOI than older ones.

Male children appeared to be affected more than females in this study (P=0.008). This finding is consistent with what was found in previous two studies.[25, 37]

The illiterate children's companions were found to be significantly associated with MOI (P=0.006). this finding was compatible with what found by many other researchers.[6, 21, 26, 33, 36, 37]

The current study revealed that children whose companions were housewives are more likely to have MOI compared to other occupations (P=0.012). This result agreed with the finding of an Ethiopian study.[37] Housewife occupation might be associated with low educational level and so the companion may have a low quality of child's health care and a poor knowledge about the importance and benefits of vaccines.

CONCLUSION

A high rate of MOI was reported in children that might indicate a presence of a coverage gap in vaccination and the main reasons were seen to be health care workers and health system related.

RECOMMENDATIONS

This problem can be solved by frequent training of the health care workers on routine immunization services emphasizing on the true contraindications to immunization and the importance of vaccinating children at every contact with the health facility after assessing their immunization statuses. Also confirming the availability of vaccination services at primary health care centers on a daily basis might reduce MOI.

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Forensic Physician and the Role in Achievement of the Criminal Justice

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ABSTRACT

Forensic learning is on the verge of the modern era of communication, speak then information exchange. The criminal choose at some stage in the criminal attachment continues between its small print yet circumstances has an advantageous function in collecting then corroboration the ability regarding reviving it. Forensic remedy considerably contributes in accordance with the removal over perplexity amongst judges, thru the strategies then capabilities over the medical practitioner anybody hold it. Which enables him thru the dissection of the body concerning the late according to expose the just the right details to that amount claimed his life. The key according to the guilt may also stay associated according to the scratching about the nose, as is noticed by way of the forensic doctor, which is grand over via the genetic fingerprint checker. A digit fingerprint is executed by using the fingerprint examiner.

Keywords: *Forensic medicine, legal evidence, Criminal investigation, DNA evidence*

INTRODUCTION

Forensic nursing is a world vision emerging among the future regarding forensic science, where fault and stroke combine the twins almost husky structures up to expectation have an effect on the lives concerning human beings whole above the ball - fitness yet justice.1 The need for insurance policies to deal with fundamental problems related according to diatribe yet its care-taker shocks are multidisciplinary. The shortage regarding skilled forensic doctors has carried according to big deficits into helpful forensic services. Modern strategies in conformity with make bigger and improve overall ponderabil standards because victims over crime, falsely accused or those falsely convicted, require the utility about forensic science in imitation of the employment over nursing.[2]

The position on forensic medication yet empiric expertise in attribution yet legal adaptation of information is of huge importance. The fundamental regulations over the judgments are based totally concerning certainty then sure bet yet are now not based totally over hesitation and suspicion, due to the fact the doubt, among general, is interpreted among prefer about the accused. The legislator had in accordance with devise legal mechanisms as would help the judiciary obtain prison sure bet so the decide may want to build his castigation concerning certainty yet certainty.3 Since the judge is a person any does no longer hold every the experiences regarding existence and the arts over science, but solely his advantage regarding legal expertise. People with empirical then scientific talents in accordance with help then help him then those any are forensic. The problem is so much now a decide calls a prison doctor to help him among a hurtful case, toughness, the forensic physician ought to stand very in a position yet unbiased therefore up to expectation the judge is furnished along correct data then that the judicial choice is legitimate or fair.

A forensic health practitioner is a medical doctor whichever performs the purposes concerning the professional and adviser within specific between forensic medicine. It is additionally recognized to that amount every man or woman anybody consists of outdoors a pragmatic examination then presents an expert intention specialized among a judicial law and consequently consists of the doctor, the expert of weapons, the fingerprint specialist, the forensic photographer yet the professional on the investigation.4

It is every medical doctor any conducts a judicial

trial or publishes an oral opinion. For example, a public doctor whoever examines the easy day by day medical facts yet gives preliminary clinical reports, the physician regarding intimate remedy whoever conducts the trial or cure concerning poisoned, or the medical doctor concerning dermatology, test and treatment regarding a character infected including genital disease or combined according to era associated in accordance with And a general practitioner whoever is treated together with a gunshot wound, an acid rely and a wound prompted through a visitors accident, yet a radiologist. He is given radiological reviews of a crack among assured mechanism. The forensic physician knows so she is the doctor anybody devotes whole his day after the job then is no longer allowed after act his walks of life abroad. Study the problems and empirical troubles so much are after him or bear the period after read then follow above the present day scientific lookup among distinct branches about forensic medicine.[5]

METHODOLOGY

Forensic Physician

The forensic health monger has dense names. He is referred to as like that homage amongst Egypt yet Jordan. In Iraq, up to expectation is acknowledged as the forensic medical doctor fit in accordance with the fact she ancient in imitation of stay formerly associated collectively including the ministry involving JusticeThe forensic health monger has dense names. He is referred to as like that homage amongst Egypt yet Jordan. In Iraq, up to expectation is acknowledged as the forensic medical doctor fit in accordance with the fact she ancient in imitation of stay formerly associated collectively including the ministry involving Justice.6 The renown may moreover stay taken out of the Turks because about theirs use. Where Iraq was once affiliated in accordance after the Ottoman governance was once moreover acknowledged namely criminal medicine, or partial accept with hence the Fame of judicial remedy the excellent names, due to the fact the saying about the court has a widespread concept, consists of justice, law, below Islamic criminal (Shara), as like as acknowledged as through way over others sinful medicine. The forensic health practitioner plays a vital position within arriving at the truth. 7 When the iniquity occurs, certain is surrounded by way of the use of a whole lot ambiguity, specially salvo the convict is a professional criminal, but it additionally depends upstairs the morality or probity about the forensic scientific doctor in work done his labor yet helping the judge. Making the wrong judicial decision, therefore, the pick out bear according to posture cautious within choosing an environment friendly forensic doctor recognized so a whole lot honor yet intelligence. [8]

Forensic nursing science and include the following:

1. Examination of the injured to determine the injury and its cause
2. Anatomy of bodies and body parts and examination of organs to identify and identify the cause of death and answer questions from investigators.
3. Attend the process of opening the grave to exhume the body to describe or autopsy to indicate the cause of death or take any other action requested by the investigating judge.
4. To express the technical opinion in the medical projections before the judiciary.
5. Age and sex determination at the request of a court or a competent official body.
6. Conducting on-site detection and inspection where appropriate.
7. Examining the facts resulting from crimes against morality and public morals.
8. Examine the seminal and bloody substances and their groups.
9. Examination of the hair and its origin.
10. Analysis of various samples such as drugs, poisons, fire, and other bodily excretions.
11. Examination of tissue samples to verify the nature and return of all methods.
12. Perform DNA tests.

The issue about transferring the forensic health merchant according to the loss of life aspect is a primary project of the forensic work, the vicinity as evaluates the surroundings circle the body, the objective conditions, the condition upstairs the body, the condition, but the clothes, yet obtaining technological information beyond the body. Monitors the transfer on the organism or gives a technological document primarily based on day out in relation to the habit over death.[9] The forensic fitness trader must, atop moving among imitation together with the demise scene, recognize to that amount the characteristic upon the forensic assignment requires him

among conformity along aid with the group regarding experts as like a great deal a section concerning that team, but the forensic doctor hold according to currently not entrust a ultimate desire due to the fact related to or the behavior about the death based completely thoroughly concerning the examination over the body at the scene.[10] The forensic doctor practices an integral by means of between attaining the truth. When a crime occurs, certain is surrounded with the useful resource of a bunch upon ambiguity, mainly agreement the sinner is a professional criminal. But certain additionally depends about the integrity but reverence of the forensic scientific physician in the common overall performance as regards his job then helps the judge. Forensic health practitioner into the workout as regards his work imminent of the issuance regarding an incorrect judicial choice as a result the figure out ought in conformity with timekeeper oversea about deciding on an efficient forensic health monger viewed namely reverence then intelligence.[11]

RESULT AND INVESTIGATION

DNA evidence

DNA proof hourly plays an important function between peccant investigations and in half instances can also keep the solely capacity about convicting a suspect. The steady improvements into forensic genetic analysis hold led after an at all paltry discovery onset for DNA containing traces. Recently, current multiple kits because exhibition regarding so-called mini-STRs have been flourished enabling detection about DNA quantities of 25 pg. then less. Nowadays, profitable DNA analysis is viable out of samples before regarded unfeasible for autosomal DNA detection, e.g. telegenic hairs, old bones then teeth, yet little quantities concerning incredibly degraded DNA. Even DNA profiles from easy fingerprints yet bullet ought to stand detected, or latter methods absolutely desire further beautify the typing success. However, the ever-continuing upgrades about forensic DNA typing worsen the best problem concerning contamination. DNA contamination execute manifest at somebody time at some point of a peccant (homicide) investigation, stand it at the fault scene, e.g. by using the policeman or fortuity personnel, during each handling about the body about the road in imitation of or at the morgue, or also all through autopsy.[12]

Criminal investigation

The looking after about its ordinary which means is the inquire because a misplaced truth and each burgher whichever is profound as regards his intuition yet printed it according to attain the entirety up to expectation occurs between face about him of this life. The inventor so he questionable concerning the conduct of his son resorted according to a method concerning research then management aimed at achieving the discovery about the imbalance in his behavior. The pleader regarding the world desires according to stay investigated when he is consulted of an interview.[13] He investigates yet verifies the young till that reaches oversea after genuine support, then the world concerning history needs an absolute type on investigation. And the superintendence among its very own sense is the investigation. The perpetrator, between guidance because inclination according to the court docket according to be brought the discipline as some know the techniques in imitation of gather evidence in conformity with prove the truth among anybody presence or rule administratively and economically yet such is natural that the procedures comply with the arrival agreement such was administratively administrative, hurtful and criminal. The superintendence is known as an executive management then a convicted care yet is additionally known namely the skill after the truth.[14]

Crimes against women and children

One concerning the nearly left out areas on stroke or misbehavior pronounced below each and each USA is Invasion among opposition in accordance with women. One atop the simply egregious or substantial violations concerning nationwide rights amongst the world. Violence within antagonism to girl consists regarding pressure yet sexual violence, lady genital mutilation, compelled marriage, stalking, business sexual exploitation such as prostitution yet pornography, trafficking, beatings, home murder, esteem killings, impact discrimination, female infanticide then sexual harassment. Violence toward ladies is currently not natural, sinful afterwards acceptable, or need in accordance with not ever posture tolerated yet justified. Everyone - humans (men and women), communities, governments then global our bodies - are accountable because supporting within conformity together with yoke aloof interpersonal Invasion then into imitation along Felicitous the struggling that causes.[15]

Medico Legal Autopsy

Medico-legal autopsy is performed, as part of the

inquest procedure, when ordered by the investigating authority in ML deaths. The in questing authority is usually civil (Police/Magistrate) but military inquest is carried out in areas where civil administrative set up is not available to carry out inquest. Under section 154, Cr PC the in questing authority can order any registered medical practitioner or medical graduate to carry out ML autopsy.A medico legal death is one which is not natural or doubtful. As a dictum, all unattended, undiagnosed, unidentified and un-natural deaths are considered as medico legal and the police are to be informed by the medical officer under section 39 of Cr PC. Since any death in the operation theatre, labor room, during post-operative period during / following invasive procedure, and can give rise to doubts in the minds of relatives and public, all such deaths are to be considered as medico legal.[16]

CONCLUSION

Find evidence of criminal has become a very complex issue in front of the evolution of criminal methods used by the offender in the implementation of his crime, the latter which deeply exploit modern technology, which has become a double-edged sword, on the one hand has contributed to the detection of crime. Hence, it seemed necessary to keep pace with this development award of criminal policy based on SC scientific progress in all fields, especially including the field of forensic medicine, which showed judicial practices to achieve the results of a high degree of trust and importance in the field of the criminal investigation made him a way to prove acceptable to the court sings the judge about the need for mental process that seeks it down to the truth ,and thus gave him a chance to activate its role in the search for evidence of criminal ,through the use of physicians immigrants in order to obtain forensic evidence that became controls the fate of the public action and thus the fate of the accused the forensic aspire always to search for scientific truth and present it to the judiciary to enlighten him to walk in the public action aimed at the application of sanctions measures of security to the shareholders in the commission of the crime ,based on the evidence or sings fixed settle in the conscience of the judge after the scrutiny and beats the balance of right and law.

Ethical Clearance: People identified as potential research participants because of their status as relatives or carers of patient's research participants by virtue of their professional role in the university and departments.

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Relationship of Bishop Score and Cervical Length by Trans-Vaginal Ultrasound with Induction of Labor in Pregnant Lady

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ABSTRACT

This was a prospective study done at Babylon Teaching Hospital, during the period from May to October 2016 . To evaluate the role of Bishop score and cervical length in predicting the success of induction of labor, 120 patients who met the inclusion criteria were enrolled in this study. Bishop score and cervical length in millimeters were measured by trans-vaginal ultrasound prior to induction, patients with conditions that contraindicated induction, prostaglandins or vaginal delivery were excluded. Successful induction i.e. delivery within 72 hours after induction was taken as primary outcome in the study. According to the Bishop score and cervical length combination, patients were categorized into 4 subgroups. When Both factors are favorable 90.9% of patients had successful induction, Bishop score was significant predictor of vaginal delivery within 72 hours in nulliparous women only, while cervical length was insignificant predictor. In conclusion, Bishop score when complimented with cervical length by trans-vaginal ultrasound could predict the success of induction of labor

Keywords: *Biishop score, cervical length, induction of labor, transvaginal ultrasonography*

INTRODUCTION

Induction of labor is procedures aimed at artificially stimulating uterine contractions to start labor. It means deliberate termination of pregnancy beyond 28 weeks [1,2] . Usually, labor induction performed by prostaglandins or oxytocin administration or by manual amniotic membrane rupturing. The transcendent objective of Obstetrics is that ' every pregnancy should culminate in healthy baby and healthy mother'. Labor induction is indicated in certain cases for either maternal or fetal conditions. Occasionally induced labor may end in instrumental delivery or cesarean section. The decision of induction depends upon the assessment of the obstetric balance by weighing the risks of continuation of pregnancy against the risks of pregnancy interrupted. Success of induction of labour depends on proper selection of cases. Before induction cervical ripening is denoted by Bishop scoring which was introduced by Bishop in 1964 . Bishop score of less than 6 requires further ripening, while a score of 9 or greater suggests that ripening is completed. Good Bishop score indicates The likelihood that induction of labor will be effective. [3, 4].

In general induction of labor is tried when a mother has are a favorable Biishop's score . Misoprostol or prostaglandin gel may be given to a mother to assist the cervix and get improved scores, however, a unfavorable score stated to be 6 or lower. [5]. When the induction is indicated, cervical ripening agent may introduced prior to planned induction by one or two nights. Scores of 8-9 indicate a very ripe cervix and high chance of successful induction [6].

Recently measurement of cervical length by TVS for prediction of success of induction of labour is being used which is having more reproducibility [5]. It has been investigated as a way of predicting the likely outcome of induced labour as an alternative to clinical digital examination described by Anderson in 1991 and also by others The elective induction can be done in various methods. The use of intravenous oxytocin

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in induction of labour increased gradually since 1950 after the discovery of oxytocic effect of the posterior pituitary extract by Dale in 1906 and the synthesis of the uterotonin by Duvigneud in 1950 . The first systemic study of prostaglandin was by Kurzork and Liebin in 1930. At present prostaglandins are used in labor [7-12]. There are many maternal and fetal indications for induction of labour among them postdated, pregnancy is probably the commonest indication . hypertention etc. as indications for induction. Though induction of labour has its own hazards like iatrogenic prematurity and associated perinatal mortality etc, but it has always been that the gains are on higher side in selected cases [11].

SUBJECTS AND METHOD

The present study was carried out on 120 pregnant women, (80 primigravidae and 40 multigravida) who were admitted in antenatal ward in General Hospital for labor during the period from May to October 2016. The study included pregnant women , with single viable foetus in cephalic presentation, at gestational age 37 – 42 weeks and not contraindicated to induction of labor. A detailed history was taken from all patients followed by general and systemic examinations. Complete obstetrical and per vaginal examination for cervical and pelvic assessments according to Bishop score were done followed by vaginal ultrasound assessment. Bishop score of less than six considered as unfavourable score and cervical length of more than 30 cm as unfavourable cervix . Additionally, the study participants subdivided into 4 subgroups according to their Bishop score and cervical length combination; (bishop score > 6 and <30 mm), (bishop score <6 and cervical length <30 mm) , (bishop score >6 and cervical length >30 mm) and (bishop score <6 and cervical length >30 mm)

When Bishop score and cervical length were unfavourable, misoprostol induction was done with 25 micrograms of tablet vaginally repeated in every 6 hours until maximum of four doses. Patients with favorable Bishop score and cervical length were induced with oxytocin or misoprostol. All cases followed with CTG . partographic representation.

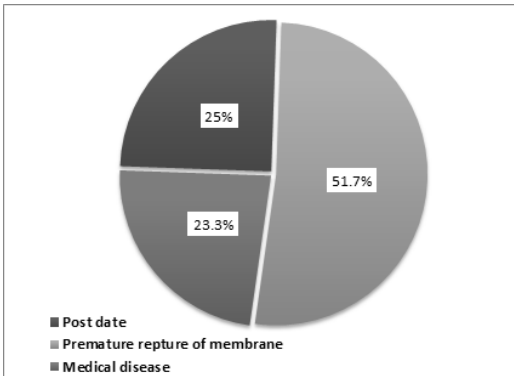
FINDINGS

The mean age of pregnant women was 26.1±7.1 (range: 20 – 40) year, furthermore, half of the studied group aged 20 – 29 years, and only 6 (5%) of participants aged 40 years or more. Regarding the gravidity, almost two thirds (66.7%) of the women were primigravida, and 66.7% delivered by normal vaginal delivery (NVD). The mean gestational age at delivery was 39.4 ± 1.48 (range: 37 – 42) weeks and the mean birth weight was 3.4 ± 0.7 (range: 2.2 – 5.0) kg, (Table 1). The indication for induction of labor was premature rupture of membrane in 51.7% of women, postdate in 25% and medical diseases in the remaining 23.3%, (Figure 1). The Bishop score was < 6 in 92 (76.7%) and ≥ 6 in 28 (23.3%) women , cervical length was ≥ 30 mm in 70 (58.3%) and < 30 mm in 50 (41.7%) women, (Table 2). Further subgrouping of the study participants was made according to their Bishop score and cervical length combination, into four subgroups, (Table 3). The cross-tabulation of Bishop score against cervical length revealed a significant association between the two parameters, (P<0.001), that cervical length of ≥ 30 associated with lower Bishop score, (less than 6) which indicated an inverse correlation between the two parameters, (Table 4). From other point of view, there was a statistically significant association, (P<0.001), between unfavorable combination of (Bishop score < 6 and cervical length > 30 mm) and delivery by cesarean section; 54.5% of pregnant women with this combination delivered by cesarean section compared to lower proportions among other combination subgroups, while all the 24 pregnant women with favorable combination (Bishop score > 6 and cervical length < 30 mm) delivered by normal vaginal mode of delivery (Table 5).

Table 1. Baseline characteristics of the studied group

Variables	Number of patients (%)*
Age	
Less than 20	24 (20.0)
20-29	60 (50.0)
30-39	30 (25.0)
≥ 40	6 (5.0)
mean ± SD (range)	26.1 ± 7.1 (16 – 40)
Gravidity	
Primigravida	80 (66.7)
Multigravida	40 (33.3)
Mode of delivery	
NVD	80 (66.7)
CS	40 (33.3)
Gestational age mean ±SD (range) week	39.4±1.48 (37-42)

Birth weight (range) kg	mean ± SD	3.4±0.7 (2.2-5.0)



** Values are frequency and percentages unless mentioned, SD: standard deviation, NVD: normal vaginal delivery, CS: Cesarean section*

Figure 1. Indications of induction of labor

Table 2. Distribution of the studied group according to their Bishop score and cervical length

Parameter		**Number of patients**	**%**
Bishop score	< 6	92	76.7
	> 6	28	23.3
Cervical length	≥ 30	70	58.3
	< 30	50	41.7

Table 3. Subgrouping of the study participants according to the Bishop score and cervical length combination

Bishop score , cervical length	**Number of patients**	**%**
>6 , <30 mm	24	20.0
<6 , <30 mm	26	21.7
>6 , >30 mm	4	3.3
<6 , >30 mm	66	55.0

Table 4. Cross-tabulation between Bishop score and cervical length of the pregnant women

	Cervical length (mm)				**Total**	
	≥ 30		**< 30**			
Bishop score	No.	%	No.	%	No.	%
Less than 6	66	94.3	26	52.0	92	76.7
More than 6	4	5.7	24	48.0	28	23.3
Total	70	58.3	50	41.7	120	100.0
Chi square= 29.2, P. value < 0.001						

Table 5. Association between (bishop score, cervical length) combination and mode of delivery of the pregnant women.

bishop score , cervical length	**Mode of delivery**				**Total**	
	Cesarean section		**Normal vaginal**			
	No.	**%**	**No.**	**%**	**No.**	**%**
>6 , <30 mm	**0**	0.0	**24**	100.0	**24**	20.0
<6 , <30 mm	**4**	15.4	**22**	84.6	**26**	21.7
>6 , >30 mm	**0**	0.0	**4**	100.0	**4**	3.3
<6 , >30 mm	**36**	54.5	**30**	45.5	**66**	55.0
Total	**40**	33.3	**80**	66.7	**120**	100.0
Fisher's exact test , P < 0.001						

DISCUSSION

The advantage of trans-vaginal sonography (TVS) as predictor of effective induction of labor in collaboration with Biishop's Score have been assessed by several authors, thus the present research attempted to assess the purpose of cervical length and Bishop score in forecasting proper induction of labor in groups of expectant mothers in Iraq. The outcomes the research were related to the same to those found by Barthaa et al., concerning, the signs of induction, and features of those affected [6]. Bartha et al. established that the number of women given prostaglandins and assigned in the unripe group for induction of labor considerably reduced employing the ultrasound thresholds as compared to the standard approach of an improved Biishop's score. An improved Bishop's score has the ability to predict the extent which are impossible to be assessed by TVS, the assessment stands to be an issue of concern in regard to variations of professional clinical skills of the assistants, nonetheless, the ultrosonography examination of the cerviix is slightly independent & could be applied in making a proper decision prior to labor inductions [5, 11]. The present research showed that both approaches to cervical examination including cervical length and Biishop's score were considerably associated with a successful induction, however, EIghorori & others, determined that

the TVS cervical size examination is superior to Biishop's score when it comes to forecasting the induction delivery period and achievement labor induction[13]. The current research established that cervical size found by TVS was greatly smaller in those womem who deliver vaginally as compared to those who delivered through cesarean section. Cervical size less than 30 mm and Bishop's score more than 6 were highly associated with proper induction, and a considerable extent of vagiinal births. Goneni eti al. [14]. determined that the T.V.S. assessment of the cerviix prior to inductiion diid have any impact on forecasting of cervical inducibility attained through an improved Bishop's score and all the approaches of examination of the cervix were highly linked to proper induction specifically, when the Bishop's score was less than the value of 6, and cervical size of 27 mm through the TVS method. Pandis et al. established that the finest minimum mark in forecasting proper induction was cervical size of 28 mm, and a Biishop's score of 3, similarly, they indicated that, the size of cervix seems to be a good forecaster of proper indication. Daskalakiis et al.[15] stated that the Biishop's score couldn't influence mode of delivery, an expectant women with a cervical size of 27.0mm is liable to give vaginal birth, likewise, Boozarjiomebrii et al.[16] established that availability of cerviical routing is considerably linked to less latent stage and less induction delivery period. Tan et al.[17] determined that TVS was less agonizing as compared to digital assessment. Therefore, both Biishop's and cervical length score were forecasters of a proper induction. Yaing eti ail.[18] stated thait the cerviical size 3.0cm or below could be a predictor of mode of delivery and labor induction. Abdelazim et al.[1] and El-mekkawi eti ali.[19] acknowledged a substantial connection between the cervical size and positive labor induction and not Biishop's score.

CONCLUSION

Trans-vaginal sonography measurement of favorable cervical length and favorable Biishop's scores were both significantly associated with successful induction and could be good predictors of successful induction.

Conflict of Interest Author declared: None

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Ethical Clearance: Data of participants were collected according to the Declaration of Helsinki, Informed verbal and signed consent were obtained from each participant pregnant woman, additionally all official agreements were obtained from the administration office of the hospital and the local ethical committee of the college of medicine and Babylon health directorate before starting the study.

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Nurse Managers' Utilization of Fayol's Theory in Nursing

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ABSTRACT

The main aim of this paper is to appreciate and evaluate human resource management practice of nurse managers utilizing Henri Fayol's theory. The study being conducted to health facilities in Southern Leyte purposively employed sixteen respondents qualified based on the inclusion criteria such as having supervisory experience of atleast five years, either male or female and with permanent employment status. The study utilized descriptive-evaluative research design in order to collect information without manipulating or changing study subjects and its environment. Demographic data were tabulated using simple percentage. Weighted mean was also used to establish different management practice delivered and implemented by nurse managers. Based from the findings, most of the nurse managers were female (87%), aging 40-47 years old, with an average gross individual monthly income of 17,000 to 25,000 thousand pesos. All of them did not have units of graduate degrees, however underwent trainings parallel to nursing practice. Education and supervisory-related trainings were acquired through shadowing and peer-coaching. Nurse managers identified that the fast turnover of staff nurses is the leading factor affecting human resource management due to low salary rate of staff nurses. Planning and controlling were the least among the five managerial roles delivered by nurse managers.

Keywords: *Nurse managers, Management theory, Nursing management*

INTRODUCTION

The American Nurse's Association defined nursing practice as the promotion, prevention, optimization of patient's abilities, alleviation of suffering through diagnosis and proper treatment and advocating in the care of different clienteles across lifespan. A nurse, as a professional performer of the nursing discipline is called to deliver what is expected of his/her profession to satisfy the acceptable level of care for the sick and well to individuals, families, communities and the population. As a nurse emerges over the changing practice in health care, he/she is also expected to assume roles as communicator, advocate, change agent, leaders and managers and research consumers. A nurse manager must recognize the need for growth within, which then translates into improvement of one's practice. Practicing nurse managers illustrate role perceptions; cite decision making and problem solving as major roles for which maintaining objectivity is a special challenge[(1)].

Rapid changes in today's health care industry are reshaping the nurse's role. The emergence of new health care systems, the shift from service orientation to business orientation, and an extensive redesign of the workplace directly affect where and how nursing care is delivered as well as those who deliver the care. Nurses must understand the health care system, the organizations they work and resources as well. They need to recognize what external factors affect their work and how to influence those forces.

In the Philippines, Health Care System is in the midst of significant and dramatic development as it continues to rapidly evolve - the devolution of hospitals to the Local Government Unit; free health care for the senior citizens; and the no-balance billing policy for the indigents. These resulted to increase number of patients

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in the hospital which in turn increased the workload of staff nurses and nurse to patient ratio adding more burdens to the nurse managers. The impact of these changes greatly affects the role of nurse managers in their practice. They are tasked with a wider range of playing both the key to ensuring quality patient care and excellent workplace for staff nurses.

The roles of managers have expanded in response to changing health care delivery, practice and the philosophical shift. In exploring the concept of management in practice, all nurses are managers[2]. They direct the work of professionals and non-professionals in order to achieve expected outcomes of care. Sullivan mentioned that nurse managers in the health care setting is responsible and accountable for the goals of the organization[3].

As stated in the Philippine Nursing Law, a person occupying managerial positions requiring knowledge of nursing must be a registered nurse, have at least two years experience in general nursing service administration; possess a degree of BSc in Nursing, with at least nine units in management and administration courses at the graduate level; and be a member of good standing of the accredited professional organization[4].

No study has been made to document how the nurse managers utilized Fayol's theory of management in human resource[5] of the nursing practice with dynamism to the changing health care practice. This study deeply appreciate and evaluate human resource management practice of nurse managers utilizing Fayol's theory in the changing health care practice which must be looked into for possible enhancement of these management components to effectively deliver care among clientele.

MATERIALS AND METHOD

The study utilized descriptive-evaluative research design to collect information without manipulating or changing study subjects and its environment. Therefore, the researcher cannot in anyway interact with the environment to avoid changes related to the study. The descriptive technique permits the statement about the identified management functions of nurse managers utilizing Fayol's theory[5].

The study as conducted to selected health care facilities in Southern Leyte. It is the only tertiary and government-owned hospital having 100 bed-capacities with an average of 85 to 95 patients and admissions daily. The hospital is divided into different wards and departments. As the catchment hospital in Southern Leyte and its neighboring provinces in the region, it also houses special areas such as operating room, Intensive care unit, emergency and delivery rooms and the office of the Integrated Provincial Health Offices (IPHO) where all community health services in the Rural Health Units (RHU) are being facilitated.

A purposive non-probability sampling was used in this study to acquire data that sufficed the research's query. A purposive sampling selected the study participants based on personal judgment guided by the set inclusion criteria. They were nurse supervisors with permanent employment status, having five years of supervisory experience, either male or female, regardless of the age at the time of data collection.

The study developed a researcher-made questionnaire based on Henri Fayol's theory of management. The tool had two parts whch includes demographic profile of the study participants such as age, gender, gross individual monthly income, number of years of supervisory experience, trainings, graduate or postgraduate programs earned and completed as of the date of the study. The second part of the instrument constitutes the five managerial functions in Henri Fayol's theory of management[5]. The five management components include planning, organizing, commanding, coordinating and controlling. Each management function has five statements and nursing stituations commonly observed in the nursing practice and workplace which also describes the function. Literature readings and systematic integrative reviews were also utilized to enhance each description under each function. A total of twenty five evaluative statements were pre-tested to nurse supevisors having the same inclusion criteria of the actual participants. The purpose of the tool pre-testing was to ensure validity and reliability of the instrument, appropriateness of the words used and comprehensiveness. The tool was Likert- scaled as follows: 5- very well delivered, 4- well delivered, 3- delivered, 2- least delivered, 1- not delivered, respectively.

The researcher communicated the heads of the nursing service where the study was conducted. Consent was signed and accomplished. Pilot test was done and incorporation of results was made prior to the actual

conduct. The survey tool was distributed, then retrieved and tabulated therafter. The researcher together with the statistician analyzed and interpreted the data.

The categorical data (demografic profile) were analyzed using frequencies and percentages[6]. For numerical data, weighted arithmetic mean was used[7] to determine the different management components adopted by the nurse managers of the hopsital's human resource.

FINDINGS AND DISCUSSION

Demographic profile

Table 1. Distribution of Age and Gender

Age 40-47 years old	Male	Female
Gender	2	14
Percentage	12.5%	87.5%

Most of the respondents ages 40-47 years old which are considered young adult as per Erikson's classification of role development. This implies according to the study of Zwick that younger supervisors are frequently associated with technical skills and knowledge, innovation, creativity, flexible to work schedules and is open to new knowledge[8]. Most of the nurse supervisors were female, which supported the findings of Wilson that the nursing profession is female-dominated work. The nursing is viewed as a caring profession so as women fit for the job due to their motherly instinct. In the presense of this limelight, men were driven away to choose nursing as their profession[9].

Table 2. Monthly Salary Gross Income and Years of Supervisory Experience

Salary	17,000-24,000
Years of experience 5 years and 11 months 6-10 years	 10 *(62.5%)* 6 *(37.5%)*

The respondents were well compensated as stipulated by Republic Act (RA) 7301 otherwise known as the Magna Carta of Public Health Workers. The RA mandated that public health workers should receive salary Grade 16 for supervisory function with increments every ten years including allowances and benefits, additional compensations and applicable incentives[10]. Dacang mentioned that in some private hospitals and health care institutions, employers can not provide higher salary since its revenue were dependent to economic viability of the hospital[11]. Patient admissions were getting smaller every time because of the high cost appropriated to health services in private hospitals which in turn limit the capacity to increase compensation of health workers.

Most of the nurse managers had five years of experience in supervisory functions. This indicates that the respondents were in the expert level classification of Benner's theory[12]. Benner novice to expert model identified nurses with at least two years of managerial experience who are proficient enough and capable to see nursing situation as a whole and more than the sum of its parts. Proficient nurses were able to learn from their daily experience and typically adjust plans in accrdance to the need of different life events. The result conformed to the requirment of RA 9173 also known as the Philippine Nursing Act of 1991 that states nursing administrators should have at least two years of experience in general administration on nursing service[10].

However, on the basis educational attainment required as supervisor, none among the respondents acquired units for graduate education. In Article VI, Section 29 of RA 9173 requires nurse managers to have nine units in management administration courses at the graduate level[10]. This was caused to weak implementation and reinforcement of the rules and regulations to be implemented. Further, the weak educational qualification of the individual hampers to receive promotion because of the seniority or ones political affiliation. On the other hand, nurse supervisors had undergone trainings like shadowing and peer-coaching. The data implies that the respondents were able to acquire knowledge that was used in supervisory role in the area of assignment. Dehghani explained that the nurse managers are responsible to directly supervise transactions in the nursing service and aid in reaching the goals of the organization. Supervisors are responsible to expand knowledge, skills and commitment of the staff nurses and nursing personnel for efficient delivery of care that is why high educational qualification is needed to guarantee the quality of care implementation[13].

Table 3. Educational Attainment and Trainings

Educational Attainment BS MA/MS/MN/MM PhD, DNS, DM	 16 0 0
Trainings	16

Table 4. Planning, Organizing, Coordinating, Commanding and Controling

Planning function	**Mean**	
s1	2.93	
s2	2.5	
s3	1.6	
s4	1.93	
s5	2.855	
Total	4.726	***2.363***
Organizing function		
s1	3.96	
s2	3.89	
s3	3.785	
s4	3.375	
s5	3.635	
Total	7.458	3.729
Coordinating		
s1	4.09	
s2	4.57	
s3	4.245	
s4	4.66	
s5	4.785	
Total	8.94	4.47
Commanding		
s1	4.785	
s2	4.945	
s3	4.66	
s4	4.715	
s5	4.93	
Total	9.614	4.807
Controlling		
s1	2.5	
s2	2.5	
s3	3	
s4	2.5	
s5	3.285	
Total	5.514	2.757

Parameters	**Interpretations**
1.01-1.49	Not delivered
1.5 -2.49	Least delivered
2.5- 3.49	Delivered
3.5- 4.49	Well delivered
4.5- 5	Very well delivered

Management Functions of Nurse Managers on Human Resource using Fayol's Theory

The table displayed the predominant management functions of nurse supervisors in the health care facility and focuses on Henri Fayol's five management functions[5]. Based from the results, nurse managers' predominant function was commanding (4.807), while the least delivered function was planning (2.363). The data implies that nurse manager's primary role was to command subordinates and ensure strict observance to chain of authority. This is to ensure proper communication and staff-manager relationship. The establishment of this connection motivates the staff nurses to shelter compliance and respect to institutional policies governing the practice of nursing. On one hand, the planning function of the nurse managers was least delivered. This effect supported the findings of Brown (2008) that planning as a dynamic function of a nurse manager was acquired on both experience and continuing education agenda[14]. The know-how prepares the nurse when circumstance of the same would ensue in the future. Education and equipment of comprehension were obtained in formal instruction course through earning a degree.

The management is about enforcing laws or setting tolerable standards in the performance and not being proactive which managers are experiencing difficulties from their day-to-day encounter[16]. Management by exception was often related to poor satisfaction and absenteeism. The fast turover of nurses in the workplace limits the nurse manager's capacity to control human resource due to low salary rate and high nurse to patient ratio. In this effect however, nurse suervisors developed new roles over time such as carative managerial role, collegial and the character to educate other hospital staffs[16].

The management is about enforcing laws or setting tolerable standards in the performance and not being proactive. Management by exception was often related to poor satisfaction and absenteeism. The fast turnover of nurses in the workplace limits the nurse manager's capacity to control human resource due to low salary rate and high nurse to patient ratio. As stated in the House Bill number 2145 of the Philippines' House pf Representatives, the nurse-patient ration in government hospitals and public health system was generally below the standard of quality nursing care. However, according to Umil (2015) that nurses were forced to perform on-duty longer tha the mandated eight hours of hospital work because of the insufficient suply of nurses[15]. The worsening condition of government hospitals became one of the leading challenges in Philippine health care sector. This resulted to inability of the nurse managers to control human resource for safe delivery of care[17].

Based on the description above, the nurse managers need to immediately prepare a plan for management improvement which is their main task, by first arranging the elements to be improved based on the priority order. In this case, there are many ways to arrange the order of priorities, for example using the Difficultness-Usefulness Pyramid (DUP) method[18].

CONCLUSION AND SUGGESTION

From the findings of the study, the researcher concluded that nurse managers were generally yonug adult, earning a gross income of 25,000 pesos per month on the average. The nurse managers acquired supervisory skills through peer- coaching and shadowing from senior managers as overseer of the daily transaction in nursing service. All of them did not obtain units in graduate programs, however attended trainings, conventions and fora for professional growth. The findings also revealed that planning and controlling were the two of the management functions least delivered while commanding was very well executed. Fast turnover of nurses and absenteeism were among the prime problems encountered by nurse managers.

Based from the results, the researcher suggests the following measures. First, nurse managers are encouraged to enroll to a graduate degree program to enhance managerial and supervisory skills. Second, the government or state legislators to revisit laws and policies in the provision of outright compensation to generate more job opportunities among nurses in the hospital to address fast turn over of nurses. Third, to develop actions to highlight other supervisory functions of the nurse such as staff development especially on human resource utilization.

Ethical Clearance, Funding and Conflict of Interest: This study has obtained ethical clearance in accordance with the provisions of research in health. All fund required for the implementation of this research come from the researchers. This research does not contain the potential for conflict of interest.

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The Relationship of Smartphone Addiction with Teenagers Mental Health in Vocational High School Padang Indonesia 2017

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ABSTRACT

Aims & Objectives: Teenagers mental health problems at this time is worrying, 1 of 7 children and adolescents aged 4-17 years or equivalent to 560,000 people have mental disorders. Using smartphones in a long time is one of many couses of mental health problems. **Material & method**: The design of this study is a cross-sectional study with sample of 275 people taken randomly using stratified random sampling method. The bivariate analysis isusing the chi-square test. **Results**: The results showed that more than half of respondents (54.5%) experienced mental health problems. Then (77%) respondents who used the smartphone with long-term use of 5-6 hours a day experienced mental health problems, so it can be concluded that the long use of smartphones significantly related to adolescents mental health in Vocational High School Padang with p = 0.000 (p <0.05). **Conclusion**: It is expected that the school can cooperate with the health services to handle mental health problems that occur in vocational high school Padang.

***Keywords**: Smartphone, addiction, teenagers, mental health*

INTRODUCTION

Smartphones in teenagers are no longer foreign thing. Almost all teenagers at this time are already use smartphones in their daily lives. This is coused by the large amount of information that can be accessed via smartphone. In 2015 smartphone users in the world are about 55.4 million people. In 2016 it is increased to 65.2 million users. It is expected that in 2019, smartphone users will increase significantly. It has been proved by Netherland research country, the result showed that 90% of adolescents are already using smartphones [1, 2]. Besides having many benefits in everyday life, smartphones are also have risk to damage health, including mental health[3-7]. Mental health disorders is one of the problem that occurred by long-term use of smartphone(over 3 hours), it is also included: excessive tension and excitement, depression, sleep disturbance, pornography [5, 8, 9]. Further impact, long-term of smartphone use is affecting the quality of human resources of the nation's successors.

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METHOD

This research uses descriptive anatilitk design with cross-sectional study approach. The research was conducted by distributing questionnaires. There is any problem when the research conduction, so questionnaires filling is assisted by teachers of Vocational High School Padang Padang. But previously before describe, the researchers explain how to fill the questionnaires first. Sample inclusion criteria are students of grade X and XI in Vocational High School Padang, Willing to be respondents, present at the time of research, and using a smartphone.

This study used a sample of 275 people with Sample selection technique in this study using a random sample (Random Sampling). The sampling technique is using Stratified Random Sampling with sampling type from a proportional sample. Univariate analysis was performed on each variable from the research result using frequency distribution test, and bivariate analysis using chi-square test.

RESULTS

Duration of smartphone Usage

Based on the results of the research in 5.4 table, it was found that from 275 respondents, there were 60 (21.8%) respondents with long duration of smartphones usage, very long smartphone usage as much as 61 (22.2%) respondents, 94 (34.2%) respondents using smartphones in medium duration, 43 (15.6%) respondents use smartphones with short duration usage and 17 (6.2%) respondents using smartphone in very short duration in Vocational High School Padang. Longest usage the most smartphone is of medium duration or as much as 3 - 4 hours per day.

MENTAL HEALTH

The results of the research on mental health of adolescents in Vocational High School Padang is known that more than half of 150 (54.5%) of respondents experienced mental health problems and 125 (45.5%) of respondents did not experience mental health problems.

In this study, respondents experiencing mental health problems can be seen from the answers to some questionnaires such as, from 150 (54.5%) of respondents who experience mental health problems 25% often feel inferior. Then 23% of respondents who experience mental health problems also often feel has a lot of problems that bother them. Furthermore, often feel happier outside the house than to be in the house also felt by 23% of respondents who have problems in mental health. 22% of respondents who experience mental health problems also often lose a lot of sleep because they feel worried and 21% are also often woke up at night.

Age of respondents are between 15 to 19 Years, with the number of respondents as many as 275 people consist of 258 men and 17 women. The result of this study shown that as many as 186 (67.6%) people perceived health problems and 89 (32.4%) people did not have health problems. The data of the long-term use of smartphones shown that as many as 121 people (44%) use smartphones more than 5 smartphones hour, 94 (34.2%) use smartphone for 3-5 hours, and only 60 people (21.8%) was using a smartphone for less than 3 hours. From all respondents it was known that 150 people (77%) had mental health problems, and 63 people (23%) had no mental health problems. Chi-square test results showed that there is a significant relationship between the long-term use of smartphones with adolescent mental health in Vocational High School 5 Padang with $p = 0.000$ ($p < 0.05$).

DISCUSSION

From the results of the research we found that the long-term use of smartphones will be very effected to the body's physical and psychological health [10-12]. There are many physical effects caused by using smartphones, including: eye disorders, back problems, hearing loss, visual impairment, sleep disturbances, loss of appetite and cancer [10, 13, 14]. While, the psychological impact of the smartphone usage in a long –term is sleep disturbance, fatigue and depression [15-17]. The results of research showed that in Vocational High School 5 Padang long-term of smartphone usage is cause mental health problems. From the research results it is known that more than half of 150 (54.5%) of respondents experienced mental health and 125 (45.5%) of respondents did not experience mental health problems.

In this study, respondents who experienced mental health is known from the answer to the questionnaire that has been given, from 150 (54.5%) of respondents who experience mental health problem, 25% often feel inferior. Then 23% of the respondents often feel they have a lot of trouble bothering them [18-20]. Then respondents who have problems with mental health feel that they often feel tired and prefer to be outdoors (23%) (21-25). 22% 22% of respondents founded, they are difficult to sleep because of feeling worried and 21% of respondents with this mental problem said that they many times wake up at night (16, 26). The results of this study are similar to studies conducted by Matar Boumosleh, J.Jaalouk, in 2017, saying that addiction to smartphones appears to lead to depression and anxiety [25, 27].

The results of chi-square test known that there is a significant relationship between the long-term use of smartphones with mental health problems $p = 0.000$ ($p < 0.05$). The results of this study indicate that the use of smartphones in a long time causes mental health problems as much as 77% and only 23% of respondents who use smartphones in the long time that did not experience mental health problems.

CONCLUSION

The longest duration of smartphones usage that most obtained from the respondents is moderate duration as

much as 34.2%. More than half of respondents (77%) have mental health problems at Vocational High School Padang Indonesia. There is a significant relationship between the lenght of smartphones usage with mental health of adolescents in Vocational High School Padang Indonesia.

Conflict of Interest : No conflict of interest arose in this study.

Source of Finding: This study was conducted using a source of funds derived from the researcher himsel.

Ethical Clearance : This study has passed of the medical reseach ethics of the Dr. M. Djamil Hospital Padang Indonesian.

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Evidence of Hyperglycemia in Patients Using Statin Therapy

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ABSTRACT

Objectives:. The use of statin as a primary mode in controlling dyslipidemia became and consequent cardiovascular ischemic events a usual trend in the practice of medicine. Thus, the aim of present Study is to study the association between statin use, in terms of the specific drug used the duration of therapy and dose of treatment, and the development of hyperglycemia and or frank diabetes in a cohort of Iraqi patients on variable statin drugs.

Patients and Methods: The study was designed to be a cross-sectional study involving a cohort of 220 Iraqi patients on statin therapy for controlling dyslipidemia. Patients were selected in a systemic random way from the population of patients already visiting the hospital and the primary health care center. Any patient who was already diagnosed by a specialist to diabetes mellitus before starting statin therapy was excluded from this study. A total of 83 days was the length of the period required to collect data from involved patients. Recent measurements of fasting and random blood sugar were obtained for all patients.

Results: Patients on statin fulfilling criteria for the diagnosis of diabetes, random blood sugar of > 200 mg/dl and/or fasting blood sugar of > 125 mg/dl, accounted for 45 out of 220 patients (20.5%). BMI, duration of statin use and a dose of statin showed a significant association with diabetes mellitus, whereas, none of the other variables had a significant effect on the prevalence rate of diabetes mellitus.

Conclusion: Statin therapy is responsible for at least in part for the development of new-onset type 2 diabetes mellitus or worsening already existing resistance to insulin action.

Keywords: *Statin, hyperglycemia*

INTRODUCTION

Diabetes mellitus comprises a group of heterogeneous disorders that share in common the criteria of chronic hyperglycemia [1]. It is one of the most commonly encountered health problems in primary health centers [2,3]. In a small proportion of patients with type 1 diabetes, the destruction of beta cells is of unknown etiology and hence considered idiopathic [4-6]. Type 2 diabetes usually encountered at an age that is older than type 1, hereditary factors plays more significant role in type 1 diabetes and those patients usually benefit from oral hypoglycemic agents at least early in the disease [7-9]. Atherosclerosis is accelerated and is more severe in patients with diabetes and its related complications such as ischemic heart disease, stroke and poor circulation to extremities, are more frequent and more severe in diabetic patients [10-13]. Efforts to control dyslipidemia in patients with ischemic heart disease, stroke patients and patients with disturbed lipid profile are core in medical practice and the use of statins becomes increasingly frequent in medical practice aiming at prevention of dyslipidemia related complications. Recent controversial studies raised the issue of glucose intolerance and frank diabetes among patients on statin therapy [14-17]; however, little has been found in Iraqi published papers concerning this association. This controversy and the poverty of Iraqi literature dealing with this subject justified the

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conductance of the current study.

PATIENTS AND METHOD

The study was designed to be a cross-sectional study involving a cohort of 220 Iraqi patients on statin therapy for controlling dyslipidemia. Patients were selected in a systemic random way from the population of patients already visiting the hospital and the primary health care center. Any patient who was already diagnosed by a specialist to diabetes mellitus before starting statin therapy was excluded from this study. The study was carried out at Al-Diwaniyah teaching hospital and Al-Forat primary health center. The beginning of data collection was dated the 20th March 2018 and ended on the 10th June 2018. A total of 83 days was the length of the period required to collect data from involved patients.

Data were, analyzed and presented using two software programs; these were the Statistical package for social sciences (SPSS) version 23 and Microsoft Office excel 2013. Numeric variables were presented as mean, standard deviation (SD) and range, whereas, categorical variables were expressed as number and percentage. Comparison of mean values between the three groups was done using one-way analysis of variance (ANOVA). The level of significance was considered at $P \leq 0.05$.

RESULTS

Characteristics of patients enrolled in the present study are shown in table 1. Data relating to diabetes mellitus are shown in table 2. The family history of diabetes was seen in 84 (38.2%) of patients. Relative who had diabetes was father, mother, sister or brother and wife in 40 (18.2%), 20 (9.1%), 12 (5.5%) and 12 (5.5%) patients respectively. Out of 220 patients, 212 (96.4%) admitted to checking blood glucose level and accordingly the results were as follows: 200 (90.9%) had blood sugar level of 110-130 mg/dl and 12 (5.5%) had blood sugar level of 161-200 mg/dl. A recent measurement of fasting blood sugar was obtained and accordingly, 45 (20.5%) had FBS in the diabetic range (≥ 126 mg/dl). In addition, random blood sugar was also assessed for all patients and accordingly, 41 (18.6%) had RBS within the diabetic range (> 200 mg/dl). Hence, if FBS measurements were taken into consideration, the prevalence of diabetes in those patients taking statin therapy will be 20.5%. Out of 220 patients, 131 (59.5%) used to check serum lipid profile, whereas, the remaining 89 (40.5%) have been not interested in measuring serum lipid profile for routine follow up. According to the duration of statin use, eight (3.6%) patients were on a statin for one month or less, 16 (7.3%) patients used statin for up to 3 months, whereas 196 (89.1%) patients used to take a statin for one year or more. According to a specific drug used, 195 (88.6%) patients used atorvastatin, 20 patients used simvastatin, five (2.3%) patients used rosuvastatin and no patience used fluvastatin. According to the dose of treatment, the majority of patients were given 20 milligrams daily, those patients accounted for 134 out of 220 (60.9%). Eighty-two (37.3%) were given 40 mg daily and only four (1.8%) were given 10 mg daily. Most patients (98.2%) taught to take the drug at night whereas, 1.8% used to take the drug at daytime. One hundred twenty-six out of 220 (57.3%) developed side effects these side effects were in the form of arthralgia (12.7%), myalgia (42.7%) and hematuria (1.8%). The majority of patients (72.3%) used to eat lipid Rich diet, 10.9 % of patients used to eat a diet with intermediate lipid content, 12.7% of patients have considered intake of lipid-poor diet and 4.1% of patients have suffered from poor appetite, as outlined in table 3. Patients on statin fulfilling criteria for the diagnosis of diabetes, random blood sugar of > 200 mg/ dl and/or fasting blood sugar of > 125 mg/dl, accounted for 45 out of 220 patients (20.5%). Table 4 showed the association between diabetes mellitus and possible risk factors.

Table 1: General characteristics of the study sample

Characteristic	*n*	%
Number of cases	220	100.0
Residency		
Urban	171	77.7
Rural	49	22.3
Age		
Mean ±SD	60.63±6.67	
Range (Min.-Max.)	45-73	
40-59 years	64	29.1
≥ 60	156	70.9
Gender		
Male	149	67.7
Female	69	31.4
Education		
Illiterate	111	50.5
Primary (not finished)	20	9.1
Primary	52	23.6

Cont... **Table 1: General characteristics of the study sample**

Secondary or higher	37	16.8
Marital status		
Married	220	100.0
Nor married	0	0.0
Economical status		
Low	38	17.3
Intermediate	161	73.2
Good	21	9.5
Smoking		
Smokers	130	59.1
≥20 per day	122	55.5
<20 per day	8	3.6
Non-smokers	90	40.9
Ethanol		
Yes	40	18.2
No	180	81.8
BMI		
Normal	110	50
Overweight	81	36.8
Obese	29	13.2
Mean ±SD	25.74 ±3.21	
Range (Min.-Max.)	21-39	

Table 2: Data regarding diabetes mellitus

Characteristic	***n***	**%**
The family history of diabetes		
Positive	84	38.2
Negative	136	61.8
diabetic Relative		
Father	40	18.2
Mother	20	9.1
Brother or sister	12	5.5
Wife or husband	12	5.5
RBS checking		
Last RBS		
Yes	212	96.4
110-130 mg/dl	200	90.9
131-160 mg/dl	0	0
161-200 mg/dl	12	5.5
No	8	3.6

Cont... **Table 2: Data regarding diabetes mellitus**

Recent FBS		
<125 mg/dl	175	79.5
≥126 /dl	45	20.5
Recent RBS		
≤ 160 mg/dl	122	55.5
161-200 mg/dl	57	25.9
> 200 mg/dl	41	18.6

Table 3: Data concerning lipid assessment and statin use

Characteristics	***n***	**%**
Serum lipid assessment		
Yes	131	59.5
No	89	40.5
Duration of statin use		
One month or less	8	3.6
UP to 3 months	16	7.3
One year or more	196	89.1
Drug used		
Atrovastatin	195	88.6
Simvastatin	20	9.1
Rosuvastatin	5	2.3
Fluvastatin	0	0
Dose		
10 mg	4	1.8
20 mg	134	60.9
40 mg	82	37.3
80 mg	0	0.0
Time of statin intake		
Night	216	98.2
Day	4	1.8
Adverse effects		
Present	126	57.3
Arthlagia	28	12.7
Myalgia	94	42.7
Hematuria	4	1.8
	94	42.7

Table 4: Association between diabetes mellitus and characteristics of the study sample

Characteristic		**Diabetic** ***n*** **= 45**	**Not diabetic** ***n*** **=175**	**Total**	***P***	**Significance**
Residency	Urban	37	134	171	0.416	not significant
	Rural	8	41	49		
Age	<60	11	53	64	0.442	not significant
	≥60	34	122	156		
Gender	Male	31	119	150	0.909	not significant
	Female	14	56	70		
Education	Illiterate	23	88	111	0.606	not significant
	Primary (not finished)	5	15	20		
	Primary	9	43	52		
	Secondary or higher	8	29	37		
Economical status	Low	7	31	38	0.886	not significant
	Intermediate	33	128	161		
	Good	5	16	21		
Smoking	Smoker	24	106	130	0.378	not significant
	Non-smoker	21	69	90		
Ethanol	Alcoholic	7	33	40	0.609	not significant
	Not alcoholic	38	142	180		
BMI	Normal	10	100	110	<0.001	Highly significant
	Overweight	15	66	81		
	Obese	20	9	29		
Family history of DM	Positive	18	66	84	0.778	not significant
	Negative	27	109	136		
Duration of statin	One month or less	0	8	8	0.007	Highly significant
	UP to 3 months	0	16	16		
	One year or more	45	151	196		
Statin drug	Atrovastatin	40	155	195	0.051	not significant
	Simvastatin	4	16	20		
	Rosuvastatin	1	4	5		
Dose	10 mg	0	4	4	<0.001	Significant
	20 mg	14	120	134		
	40 mg	31	51	82		

DISCUSSION

The present study demonstrated that patients on statin therapy had a significantly higher rate of hyperglycemia and new-onset diabetes than the prevalence rate of diabetes in the general adult population. In addition, this study showed that duration of using statin and the dose had a significant positive correlation with the development of diabetes mellitus in patients who were not originally known to have diabetes mellitus. The analysis done by Sattar et al. in 91,140 topics displayed a 9% overall risk in 13 RCTs over a mean period of 4.0 years [18,19]. In a consequent meta-analysis of five severe-dose statin trials, Preiss et al. stated a important increase in diabetes incidence with more intensive- vs. moderate-dose statin (OR 1.12; 95% CI 1.04–1.22) [20]. generally, there was no correlation between % LDL-C reduction and incident diabetes. Further analysis of baseline features of the numerous trials stated a solid correlation

between features of metabolic syndrome [21-23].

Notable, the risk–advantage ratio for CVD quiet obviously preferred statin treatment in various revisions, including JUPITER, in primary prevention [22], and many secondary prevention studies [21-23]. Thus, nevertheless of whether or not diabetes was diagnosed during statin therapy, the CVD consequences were decreased on statin therapy matched to those observed with placebo. Another meta-analysis by Navarese et al. is the largest so far: it includes 17 RCTs, compared new-onset diabetes in patients getting statin vs. placebo, or high-dose vs. judicious-dose statins [24,25]. The lowermost risk was seen with pravastatin 40 mg compared to placebo (OR 1.07; 95% CI 0.83–1.30), whereas rosuvastatin 20 mg have the highest risk (OR 1.25; 95% CI 0.82–1.90) and atorvastatin 80 mg have intermediate (OR 1.15; 95% CI 0.9–1.50), even though none of these differences reached statistical worth. These data indicate likely molecule-precise effects on diabetogenesis[26]. In the biggest study of over 2 million patients in the UK, there was a substantial time-dependent rise in diabetes risk (HR 1.57; 95% CI 1.55–1.60), which augmented more (HR 3.63; 95% CI 2.44–5.38) in those who were followed for up to 15–20 years [27]. In one study in patients following myocardial infarction, there was no difference in intensive- vs. moderate-dose statin therapy [28]. It is well-known that the risk for diabetes according to the existence of pre-existing diabetes risk influences, as mentioned in the several analyses of RCTs [21-23], There are some remarks of interest from some studies in patients with pre-existing glucose intolerance or diabetes. In the study by [29]. The HR for progression to diabetes was like in those with normoglycemia, or reduced fasting glucose at baseline, but both groups displayed a comparable decrease in mortality after a 6-year follow-up. In a meta-analysis of nine RCTs in 9696 patients with type 2 diabetes, with a mean follow-up of 3.6 years, there was a modest but important increase in the mean A1c level of 0.12% (95% CI 0.04–0.20) [30-31].

Conflicts of Interest: There is no conflict of interest.

Ethical Clearance: The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/ have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity.

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Prevalence of Color Vision Blindness at Al-Qadisiyah University

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ABSTRACT

Background: Color vision blindness is an important X linked autosomal recessive visual defect affecting the perception of colors.

Purpose: To determine the prevalence of color vision deficiency among a sample of medical colleges group in AL-Qadisiyah university (medical colleges , college of pharmacy and nursing college)

Method: Across-sectional study done in AL-Diwaniah city at the period from April 2018 to June. 2018 study carried out to assess the prevalence of color vision deficiency among sample of medical colleges group student a sample of 814 student 252 male and 562 females with age range 18 – 24 years all are examined by Ishihara 38 plates.

Result: The prevalence of color vision deficiency was 5.2% for male and 0.4% for female. Deutant more than protan 11 cases deutan 1 female and 10 male while protan 4 cases 1 female and 3 male. There was no significant relation between color vision deficiency and the degree of relationship of the parents.

Conclusion: Prevalence of color vision deficiency in a sample of medical student is (1.8%) with prevalence in male (5.2%) and in female 0.4% Deutan more than protan. There is no relation between color vision deficiency and the degree of parent relationship.

Keyword*: Deutan, protan, Color blindness.*

INTRODUCTION

Color vision deficiency (CVD) is a chief disorder of the vision that affect the ability to notice some colors or pick out their difference.(1)

The mammalians retina contain two kinds of cells that receive light. They are termed as rods and cone [Rods] can become aware of brightness as well as darkness and are very sensitive to low light level while the Cones cells can detect colors and are concentrated near the center of the vision(2).

The Color vision deficiency is happened when one or more kinds of color receptive[cones]cells red and green as well as blue do not precisely draw together or throw a right color impulses to the optic nerve . The CVD may be hereditary or due to many other causes that affect the color vision. The hereditary kind is habitually linked to the X chromosome red and green CVD so as it is more occurrence in boys than girls, also it may be less frequently an autosomal prevailing quality blue and yellow CVD and so infrequently an autosomal recessive congenital feature[Achromatopsia]total color vision deficiency (3-4-5).

The Achromatopsic patient is almost always has additional defect with vision including decrease visual acuity and hyper sensitivity to light (photophobia) and small unconscious eye motion (nystagmus) (6,7).

The condition are divided in to three major categories: red-green CVD . The second categories blue –yellow CVD and a complete absence of color vision a persons with a red-green defect related to a loss or abnormality of the red sensitive pigment are said to have protan defect protanomaly and protanopia according to

the severity of defect while those with loss or abnormality of the green sensitive cone pigment have a deutan defect also according to the severity (deuteranomalous and deteranopia). Yellow-blue CVD is a tritan defect also either tritanomalous or tritanopia. [7] a good number widespread CVD is the red and green color which is called Daltonism[8] The deficiency of red green color with it is sub type further widespread than blue(CVD) that is so less frequent. [9-11]

SUBJECT AND METHOD

Across sectional study designed to found the prevalence of CVD among a sample of student in the medical colleges group at AL-Qadissiyah university in a period from April 2018 – June. 2018 a sample of 814 student 562 female and 252 male with average age of 18 – 24 years mean age of 20.82 ± 1.58 have been examined after taking their permission for examination and including in the study. Data were collected using a pre-constructed data collection form, which was formulated for the purpose of this study. The general characteristic of the collection formula were

1. Name.
2. Age.
3. Gender.
4. Occupation.
5. Past medical history.
6. Past ocular history.
7. Family history.
8. Dose the parent relative or not? first and second degree relative considered as positive any other considered negative.
9. Result of examination.

Inclusion Criteria

1. Healthy student age 18 – 24 years.
2. Visual acuity not less than 6/6 or corrected by spectacle or contact lenses.

Exclusion Criteria

1. Student with history of ocular Trauma or surgery.
2. History of medical diseases like Diabetes or Hypertension.
3. History of using drug that affect color vision like digoxin , anti-epileptic drug and barbiturate.

Way Of Examination

All student after taking their permission for examination are examined for visual acuity using Snellen chart. CVD was tested by using pseudo-iso chromatic Ishihara plates which is a good and quick process of examine the defected of color vision from that vision which is normal . we consider using Ishihara plates of 38 plate were used by putting the plate in front of the Student at 70cm in the day light not direct sun light . Each plate have been offered to the student for three to four seconds and they were asked to read all numbers presented in the plate .

Plates from one to twelve revealed the normality or abnormality of color vision if 17 plates reads correctly this mean normal color vision, when the student see thirteen or less this mean defect in color vision red - green defect. The plate 22 to 25 were used to differentiate red color defect kind and green color defect kind.[12] The plate 30 to 38 were used when the patient cannot read the number in plates determined the lines between a two X should be done and completed at ten seconds.

RESULTS

Distribution Of Study Sample According To Age And Gender

The study, as stated in the chapter of patients and methods, included 814 students with a mean age of 20.82 ±1.58 years and an age range of 18 to 24 years. Male subjects comprised 252 out of 814 (31.0 %), whereas, female subjects contributed to 562 out of 814 (69.0%). Mean age of male subjects was not significantly different from that of female subjects, 21.52±1.56 years versus 20.51± 1.49 years, respectively (*P*=0.137), as shown in table 1.

Table 1: Mean age and gender of subjects enrolled in the present study

Gender	*n*	Mean Age	SD	Mini-mum	Maxi-mum	*P**
Male	252	21.52	1.56	18	24	0.137 NS
Female	562	20.51	1.49	18	24	
Total	814	20.82	1.58	18	24	

N: number of cases; SD: Standard deviation;* Independent samples t-test; NS: not significant

Rate Of Color Blindness

The rate of color blindness in the study sample was 15 out of 814 (1.8%), as shown in figure 1. Patients with protan (red color) blindness accounted for 4 out of 814 (0.5%), whereas, patients with deutan (green color) blindness were more frequent and accounted for 11 out of 814 (1.3%), as shown in figure 1 and table 2.

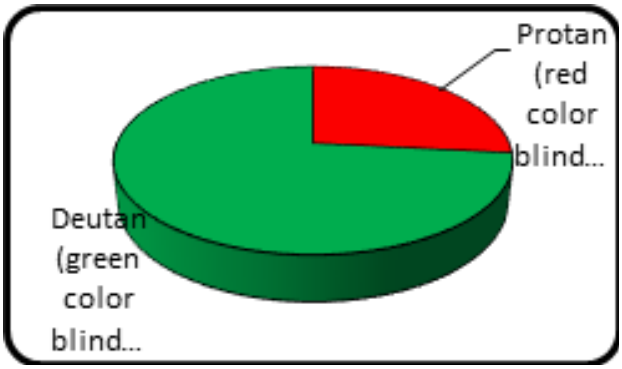

Figure 1: Pie chart showing the proportion of patients with protan (red color) and deutan (green color) blindness

Table 2: Proportions of patients with color blindness

Characteristic	*n*	% out of total	% out of patients
Color blindness	15	1.8	100
Protan (red color)	4	0.5	26.7
Deutan (green color)	11	1.3	73.3

No case of total CVD is found

No blue – yellow CVD can be detected.

Correlation Between Age And Color Blindness

Mean age of all patients with color blindness was 21.33 ±1.68 years, whereas, mean age of normal subjects was 20.81 ± 1.58 years and there was no statistical difference in mean age between patients with color blindness and normal subjects (P=0.205), as shown in figure 2. Mean age of patients with protan (red color) blindness was 20.25 ± 1.26 years and that of patients with deutan (green color) blindness was 21.73 ± 1.68 years and there was no statistical difference in mean age between the two groups (P = 0.136), as shown in figure 3.

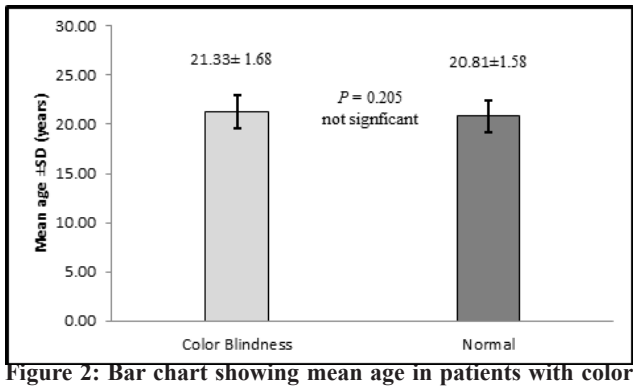

Figure 2: Bar chart showing mean age in patients with color blindness in comparison to normal subjects

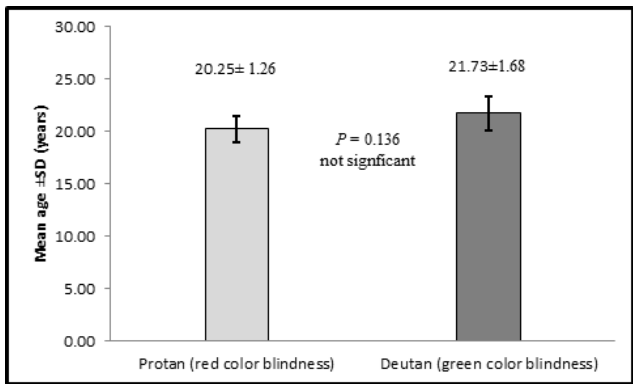

Figure 3: Bar chart showing mean age in patients with protan (red color blindness) versus patients with deutan (green color blindness)

Association Between Gender And Color Blindness

As shown in table3. Out of all patients with color blindness, 13 were male patients accounting for 5.2% out of all male participants and 2 were female patients accounting for 0.4% out of all female participants. The difference statistically was highly significance (P<0.001) and the risk of having color blindness was 15.23 in male subjects in comparison with female subjects with a 95% confidence interval of 3.41 - 68.01. On the other hand, patients with protan (red color) blindness included 3 male and 1 female subjects accounting for 1.2 % and 0.2% out of all male and female participants, respectively, the difference was statistically not significant (P=0.171); however, the risk of having protan color blindness in male subjects was 6.67 in comparison with female subjects with a confidence interval of 0.70 - 65.30. Moreover, patients with deutan (green color) blindness included 10 male and 1 female subjects accounting for 4.0 % and 0.2% out of all male and female participants, respectively, the difference was statistically highly significant (P<0.001); the risk of having deutan color blindness in male subjects was 23.18 in comparison with female subjects with a confidence interval of 2.95 - 182.10.

Table 3: Association between gender and color blindness

Color blindness	Male n = 252	Female n = 562	P*	Odds Ratio	95% CI
All, *n* (%)	13 (5.2)	2 (0.4)	<0.001	15.23	3.41 - 68.01
Protan, *n* (%)	3 (1.2)	1 (0.2)	0.171	6.76	0.70 - 65.30
Deutan, *n* (%)	10 (4.0)	1 (0.2)	<0.001	23.18	2.95 - 182.10

n: number of cases; *Chi-Square after Yates correction for continuity; CI: confidence interval

Association Between CVD And Parent Relationship

We found that 3.3% of cases of CVD have closed relationship parent. 1.2% have no close relationship parent but this difference is not statistically significant (p. value = 0.088), as shown in table 4.

Table 4: Association between color blindness and parent whether relative or not

Parent, relative	Total	Positive test	Negative test	χ^2	*P**
Yes	244	8 (3.3%)	236 (96.7%)	2.919	0.088 Not significant
No	570	7 (1.2%)	563 (98.8%)		
Total	814	15 (1.8%)	799 (98.2%)		

*Yates corrected Chi-Square test for continuity

DISCUSSION

Present study found that male also affected more than female ; out of all student participate in the study (814) student 15 student are color blind; 13 of them were males student accounting for 5.2% out of all male participate (252) and 2 were females student accounting for 0.4% out of all females participates (562). The numbers of female student in the medical colleges group are more than males for this reason the number of female in the sample are more than male. Studying the other researches result for CVD prevalence throughout the world shows that it is 0.8 – 9.3% among males and 0.4 – 3.2% among females. [13]

Many other studies done in Iraq show result near to our result for example:- prevalence of CVD among the student in Erbil city of 8.47% in male and 1.37% in the females [14].

Among adult in Baghdad were 6.75% [14]. Study done in Shekhan city in AL-Duhok province, Kurdistan Region in Iraq show prevalence of 6.36% in male and 0.84% of female of high school student [15].

Another study done at AL-Diwaniah city AL-Qadissiyah province for prevalence of congenital red- green CVD among medical student and medical personal in AL-Diwaniah teaching hospital show 4.8% prevalence among male and 1% among female [16]. In Saudi Arabia 2.9 – 11% in male [17-19]. In Qazvin 3.49% of the total population had CVD 2.56% male and 0.93% were female [20]. In Tehran 8.18% [21]. In Jordan the prevalence was 8.72% in males [22] . Study for CVD in European countries show in a Denmark male were 8.7% while in Greek males were 7.95% [23]. In our study the prevalence of female with CVD were 0.4% which is near to the other studies like in Indian population 0.83% [24]. The color vision blind patient will not just confuse red and green only because the peak of sensitivity of red and green cone cells (cone cells present in the center of the retina responsible for color vision) is very close to each other so those person will be unable to discriminate any color which contain red or green [25]

In our study we found that deutan CVD (green CVD) is more than protan CVD (red CVD). 11 case from the total student affected. By CVD which are (15) student (10) male and (1) female subject accounting for 4.0% and 0.2% out of all male and female participants, respectively while protan (red CVD) included 3 cases male and 1 case female student accounting for 1.2% and 0.2% out of all male and female participant respectively. The deutan more than the protan.

When we compare with other researches In Indian about 7.9% deutan and 3.22% protan[26]. The cause of this classification of CVD as protan and deutan that at first it is the most common CVD the second cause is that we use only Ishihara plate for testing the CVD which can only used for red – green color blindness not blue – yellow color blindness also it is simple and popular.

CONCLUSION

The prevalence of CVD is 1.8% in total sample of

student with a prevalence of 5.2% in male and 0.4% for female student. The Deutans CVD were more the protans CVD deutan 4% in male and 0.2% in females . While protan 1.2% in male and 0.2% in female.

Ethical Clearance: The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/ have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity.

Conflicts of Interest: There is no conflicts of interest.

Source of Fund: Self

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Youth Resilience Capabilities Avoid Free Sex, HIV/AIDS and Drugs based on *Sekaa Teruna*

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ABSTRACT

Adolescence is the age where individuals integrate with adult society. Integration in society has an effective aspect, more or less related to puberty, including striking intellectual changes. Adolescents are more prone to risk behavior due to psycho-social influences, namely limited ability to think logically, the ability to regulate weak emotions, and the influence of peers. The purpose of this study was to improve the ability of adolescent resilience to avoid free sex, HIV / AIDS and drugs based on *Sekaa Teruna* in the Nongan village, Karangasem and Ketewel village, Gianyar. The quasi experimental research with Pre test-posttest control group design was carried out in the villages of Nongan, Karangasem and Ketewel, Gianyar from August to September 2017. Data collection instruments are Spritually Resilient Assessment Packet version 44. Data analysis was performed including descriptive analysis and bivariate analysis with Wilcoxon test and Mann-Whitney test.

The ability of adolescent resilience (about free sex, HIV-AIDS, and drugs) before treatment in the control group, 45.0% of resilient adolescents and in the treatment group 76.7% of resilient adolescents. The ability of adolescent resilience after treatment in the control group, 55.0% of resilient adolescents and in the treatment group 100% of resilient adolescents. There are differences in adolescent resilience before and after being treated both in the control group and in the treatment group There are differences in adolescent resilience in both the control and treatment groups

Keywords: *Adolescent, Resilience, Sekaa Teruna*

INTRODUCTION

Many challenges must be faced by teenagers in the era of globalization. The challenge comes from increasing school demands, free communication / internet access, and access to print and electronic media broadcasts. If adolescents are not able to respond to challenges positively, it will have a negative impact on family, community, social environment, and even threaten and endanger the future of the nation and the state.

Adolescence is the age where individuals integrate with adult society. Integration in society has an effective aspect, more or less related to puberty, including striking intellectual changes (Piaget in Hurlock) [(1)]. At this time mood can change very quickly. Drastic mood changes in teenagers are often due to homework, school work, or daily activities at home. Sometimes teenagers do things that are outside the norm to get recognition about their existence in the community [(2)]

There are many problems in young people include: behaviors that contribute to acts of violence and accidental accidents, use of illegal drugs and smoking, having unsafe sex, unsafe diet, and inadequate physical activity [(3–5)]. Adolescents are more prone to risk behavior due to psycho-social influences [(6)].

Premarital sexual behavior is all sexual behavior that is driven by the opposite sex sexual desire that is done before marriage [(2)]. Approximately 47.0% of the population of teenagers aged 10 to 19 years in the world have had active sexual intercourse and around 2.4% end up with pregnancy before marriage [(5)].

The impact of premarital sex behavior is experienced more heavily in women than men. This impact includes

biological, social and psychological aspects [7–11].

The holder of the control of the lives of the Balinese people is the traditional village, so that almost all individual activities are full of traditional sequences. *Adat* also means rules, laws, moral standards that guide everyone. Balinese people are said to succeed in maintaining cultural values because religious traditions are still strong. Changes in social solidarity in the community in Bali, such as premarital sex behavior is not a social problem but a personal problem that must be solved personally [12]. Premarital sexual behavior that spreads very quickly and widely in the neighborhood where people live has been considered normal, in addition to the consequences of weak traditional sanctions today. Thus, it is necessary to explore the role of resilience and other factors that influence teenage premarital sex behavior in Bali.

Delinquency and abuse of drugs that occur involve a lot of teenagers. In addition, many teenagers also have deviant sexual behavior. The intervention program for adolescents should be through positive youth development programs. One reliable way for teenagers in Bali is Sekaa Teruna. Sekaa Teruna is a youth organization that functions as a forum for developing youth creativity. This organization can also be a place to preserve local culture and traditions.

Local governments need to improve the function of Sekaa taruna to protect teenagers. The results of interviews with the community leader at Nongan and Ketewel Village showed that *Sekaa Teruna* as a youth organization had not carried out its role well. Resilience is the ability to respond healthily and productively when facing obstacles or trauma [13]. Resilience is a tenacious and resilient attitude that a person has when faced with difficult conditions [14]. The problem in this study is how the influence of *Sekaa Teruna*-based counseling on adolescent resilience?

The purpose of this study was to improve the ability of adolescent resilience to avoid free sex, HIV/AIDS and drugs based on *Sekaa Teruna* in the Nongan village, Karangasem and Ketewel village, Gianyar

MATERIALS AND METHOD

This type of research is quasi experimental research with Pre test-posttest control group design [15]. The research was carried out in the villages of Nongan, Karangasem and Ketewel, Gianyar from August to September 2017. Consideration of research location selection due to the high incidence of drug abuse and deviant sexual behavior by teenagers in the village.

The population is all adolescents in the village of Nongan, Karangasem and Ketewel, Gianyar with the unit of analysis are adolescents members *sekaa teruna*. Sample selection is nonprobability. The inclusion criteria included: registered as a member of a group of Nongan Karangasem Village cadets and Ketewel Village, Gianyar; no psychiatric disorder based on family member information; without chronic diseases; can read and write. The sample size is calculated by the large sample formula developed by Isaac and Michael with a 5% error rate [16] and an additional 10% to anticipate drop out so that the sample size becomes 60 people. Data collection instruments are standardized questionnaires, namely SRA-44 which was coined by Jared K and Lynn K. from the Institute of Contemplative Edication, Cambridge. The questionnaire has seven answer choices. However, in this study the choice of answers was modified into four answer choices. Data analysis was performed including descriptive analysis and bivariate analysis with Wilcoxon test and Mann-Whitney test.

RESULT AND DISCUSSION

Result

Nongan village is an intervention group where it is treated in the form of health counseling with media modules and leaflets. This village consists of 14 *banjars*. The population of Nongan Village is 6646 people consisting of 3319 female and 3327 male. The number of teenagers is 867 people, with 463 male and 404 female. Ketewel Village is a control group with convensional health counseling using leaflets. This village consists of 15 banjars. The population is 10,298,000 people consisting of 5,192,000 women and 5,106,000 men. The number of adolescents is 1,267 with details of 654 male and 613 female.

Characteristics of respondents observed included: gender, age, and education. The data is presented in Table 1.

Table 1: Demographic characteristics of Respondents

Characteristics	Intervention group		Control group	
	f	%	f	%
Gender Male Female	 27 33	 45 55	 21 39	 35 65
Education level Middle school High school Diploma Bachelor	 4 50 6 0	 6.7 83.3 10.0 0.0	 1 32 7 20	 1.7 53.3 11.7 33.3
Total	60	100	60	100
Age (year) Minimum Maximum Average Standard deviation	 17.0 27.0 19.8 2.3		 17.0 29.0 22.0 2.3	

In table 1, it can be seen that the respondents in the intervention group were more women (55%), as well as in the control group more women (65%). Based on the level of education in the treatment group, the respondents were mostly high school (83.3%), and in the control group some were high school (53.3%). Based on the age of respondents in the intervention group, the average age was 19.8±2.33 years, while in the intervention group was 22,016±2.38 years.

Table 2: Descriptive of Adolescent Resilience Ability

Descriptive	Intervention group	Control group
Before intervention		
Mean Median Standard deviation Minimum Maximum	82.45 82.00 0.90 80.00 85.00	84.40 85.00 4.26 71.00 95.00
After intervention		
Mean Median Standard deviation Minimum Maximum	104.05 104.00 3.08 97.00 116.00	128.00 128.00 0.00 128.00 128.00

From table 2, it is known that the average ability of adolescent resilience before treatment in the control group was 82.45 and after treatment 104.05. The average ability of adolescent resilience before treatment in the treatment group was 84.40 and after treatment became 128.00.

Table 3: Frequency Distribution of Adolescent Resilience Ability

Resilience Ability	Intervention group		Control group	
	f	%	f	%
Before intervention				
Resilient	46	76.7	27	45.0
Not resilient	14	23.3	33	55.0
After intervention				
Resilient	60	100	33	55.0
Not resilient	0	0	27	45.0
Total	60	100	60	100

Before the treatment, respondents from the treatment group mostly (76.7%) had the ability to resilience, while from the control group who had the ability to resilience less than half (45%). After the treatment, there was an increase, namely that in all the respondents, the intervention group had the ability to resilience (100%) and while in the control group who had the ability to resilience to 55%. The difference in the ability of adolescent resilience about free sex, HIV/AIDS and drugs before and after the intervention was carried out using the Wilcoxon test.

Table 4: Differences in Adolescent Resilience in Treatment and Control Groups

Deskriptive	Intervention group			Control Group		
	Pre	Post	p Value	Pre	Post	p Value
Mean	84.40	128.00		82.45	104.05	
Median	85.0	128.00		82.0	104.0	0.00
Standard deviation	4.26	0.00	0.00	0.90	3.08	
Minimum	71.0	128.00		80.0	97.0	
Maximum	95.0	128.00		85.0	116.0	

In table 6 it can be seen that there is an increase in ability which means teenage resilience in the treatment group ($p<0.05$) and the control group ($p<0.05$). The difference in the effect of treatment in the treatment group and control on the ability of adolescent resilience before and after the intervention was done with the Mann Whitney test.

The test results showed an increase in the effect of adolescent resilience the treatment group was higher than the control which was 45.75. Health education using modules, and leaflets can significantly improve teenage resilience ($p<0.05$).

DISCUSSION

Adolescents must have the ability to avoid problems that might occur. Even if teenagers have to face and overcome problems, they must become stronger. The conditions mentioned above are called resilience. The results of the study showed that adolescents at both research sites had resilience abilities about free sex, HIV/AIDS and drugs. The results showed that in the treatment group there was an increase in resilience in adolescents up to 100% and in the control group there was an increase of up to 55%. Thus it can be concluded that health counseling with the lecture method, discussion and question and answer as well as supplemented with leaflets in the control group as well as modules and leaflets for the treatment group can improve youth resilience.

Resilience in other studies is also interpreted as the ability to bounce back to continue living after experiencing problems getting better. In this case the

relation to the condition if, for example, teenagers are faced with conditions already undergoing risky behaviors namely free sex, HIV-AIDS and drugs. The factors that influence resilience are not only individual and genetic but also cultures that might increase or decrease resilience.

In the results of the study there was an increase in the ability of adolescent resilience in the control group and the treatment group. The results of this study are in accordance with Delyana's (2015) study in Yogyakarta which found that the knowledge and attitudes of adolescents about premarital sex changed significantly before and after being given sexual education. In line with Sarwono's (2011) theory that sexual education is an effective way to prevent risky behavior in adolescents, especially premarital sex behavior.

Respondents from the treatment and control groups, in addition to being given exposure or counseling about resilience, but also equipped with modules and leaflets, with the hope that teenagers are able to read again about tips and tricks to be resilient towards risky behavior. This is consistent with Azwar's (2011) theory that changes in adolescent knowledge and attitudes, should be supported by personal experience, support from the environment, including the mass media, especially support from parents. The more often teenagers get positive support and information about resilience, then the ability of adolescents will increase to prevent risky behavior.

Teenagers who have high resilience have the possibility to develop faster and be happier than adolescents who do not have or have the ability to bounce back from adversity (Reivich & Shatte, 2002). The fundamental assumption in the study of resilience is that some individuals remain fine, even though they have experienced adversity and risk-laden situations, while some other individuals fail to adapt and fall into adversity or even heavier risks.

The results showed that health education with a module and leaflet media in treatment and leaflet groups in the control group could increase adolescent resilience ($p<0.05$). Reivich & Shatte states that: People can increase their resilience by learning to understand their thingking styles and developing skills to circumvent them so that you can see the true causes of adversity and its effect of life. Thingking style is what causes us to respond emotionally to events, so it's your thingking style that determines your level of resilience the ability to overcome, steer through, and bounce back when adversity strikes. A person can use his thinking style to overcome the negative consequences of a debilitating event.

This type of counseling media is diverse. The use of media aims to clarify the information conveyed in the counseling. The more media used, the more teenagers understand the material presented. Pri Hastuti and Luluk Mahaningsih (2009) found that lecturing by giving modules was more effective than lectures by giving leaflets. The module contains more detailed information than leaflets, allowing respondents to learn more independently.

Resilient ability in adolescents increases when information is, received complete, clear and consistent. This requirement can be accommodated in a module, as a learning medium. However, the module will not function effectively if it is not accompanied by counseling. In the extension process, there is a perception stage where participants are invited to equalize perceptions between the instructor and participants. Perception is very important to equalize the information conveyed.

The results of this study are different from the results of Pahalani's (2016) study, which revealed emotion regulation therapy using modules as guidelines did not have a significant influence on the ability of teenagers resilience living in orphanages. It is explained that many factors influence youth resilience, especially support from parents and the surrounding environment.

CONCLUSION

The ability of adolescent resilience (about free sex, HIV-AIDS, and drugs) before treatment in the control group, 45.0% of resilient adolescents and in the treatment group 76.7% of resilient adolescents

The ability of adolescent resilience after treatment in the control group, 55.0% of resilient adolescents and in the treatment group 100% of resilient adolescents

There are differences in adolescent resilience before and after being treated both in the control group and in the treatment group

There are differences in adolescent resilience in both the control and treatment groups

Recommendation

Based on the results of the study it can be suggested as follows: 1) For policyholders in the field of Reproductive Health in order to carry out socialization activities on Adolescent Reproductive Health in the form of counseling to Sekaa Teruna regularly and continuously. 2) For the Indigenous village leader to facilitate socialization activities on risky behavior in adolescents. 3) For teenagers to actively seek information so that they have good knowledge and are able to choose healthy things to do.

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Effect of Salpingectomy on Anti Müllerian Hormone, Follicle-Stimulating Hormone and Inhibin B Hormone

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ABSTRACT

Background: Ovarian reserve refers to the term used to describe the number of good quality oocytes left within a woman's ovaries. Salpingectomy undermines the ovarian reserve since it interrupts the ovarian blood supply.

Patients and method: A case-control study conducted in Baghdad teaching hospital from the 1st March 2015 to the 1st March 2016 in which a total of one hundred women were included in this study and divided into two groups (every 50 women), cases with a history of salpingectomy and the control.

The aim of the study: To assess the effect of salpingectomy for tubal pregnancy on biochemical ovarian reserve tests (FSH, AMH, and Inhibin B hormone).

Results: Mean age of the women was 27.8 ± 3.5 years in salpingectomy group. FSH level in salpingectomy group was significantly higher than that in controls (7.9 ± 1.4 vs. 7.3 ± 1.2 mIU/mL, respectively). AMH (4.4 ± 1.0 vs. 7.6 ± 3.6) and inhibin B (309.5 ± 208.8 vs. 414.1 ± 288.9) was significantly lower in salpingectomy group than controls.

Conclusion: Salpingectomy is associated with decreased AMH and inhibin B levels while it associated with increased FSH level. These results suggest that salpingectomy associated with decreased ovarian reserve.

Keywords: *Anti Müllerian, Inhibin B, ovarian reserve, salpingectomy*

INTRODUCTION

Ovarian reserve refers to the size of non-growing follicles or resting primordial follicle population in the ovaries and this, in turn, determines the number of growing follicles, the quality or reproductive potential of their oocyte, which describe the number of good quality oocytes left within a woman's ovaries. A woman's fertility declines with age due to a reduction in the number of eggs (oocyte) in the ovaries. Egg quality also declines with age which further affects fertility potential. [1, 2] Diminishing ovarian reserve is a phenomenon noted in women during mid to late thirties and at times earlier, reflecting the declining follicular pool and oocyte quality. [3] Ovarian reserve tests provide an indirect estimate of a woman's remaining follicular pool. Biological (age), biochemical, biophysical, and histological tests have been used to identify ovarian reserve. [4] The age is known to be the most important factor determining the pregnancy potential in regularly cycling women. [5] However, chronological age alone has a limited value in predicting individual ovarian responses, [6, 7] which led to the development and use of various biochemical tests of ovarian reserve. [7]

Basal follicle stimulating hormone (FSH) levels measured on day 3 of the menstrual cycle is the most widely used to assess the ovarian response to stimulation. [6] An increase in FSH levels occurs due to follicle depletion. It is known to have diurnal, intra- and intercycle variability. There is no universally accepted

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cut-off value to identify a poor response. [8, 9] Anti-Müllerian hormone (AMH) is a dimeric glycoprotein exclusively produced by granulosa cells of preantral and small antral follicles in the ovary, [10, 11] it can be measured on any day of the cycle and does not exhibit intercycle variability. [12, 13]

Inhibin B is a heterodimeric glycoprotein released by the granulosa cells of the follicle. Women with a low day three inhibin B concentration (<45 pg/ml) have a poor response to superovulation for IVF and are less likely to conceive a clinical pregnancy. It also noted that a decrease in inhibin B probably precedes the increase in the FSH concentration. [14, 15] The effect of salpingectomy on ovarian function is uncertain and remains a matter of debate. [16, 17] The close anatomical association of the vascular and nervous supply to the tube and ovary constitute the theoretical rationale for the risk of impaired ovarian function after surgery. [18] The study aims to assess the effect of salpingectomy for tubal pregnancy on biochemical ovarian reserve tests (FSH, AMH, and Inhibin B hormone).

PATIENTS AND METHOD

A case-control study conducted in Baghdad teaching hospital from the 1st March 2015 to 1st March 2016 in which a total of one hundred women were included in this study and divided into two groups: group A: 50 patients' women with history of salpingectomy (cases), group B: 50 normal women with no history of salpingectomy (control). Inclusion criteria: Women with age less than 40 years with regular menstrual cycles (no history of oligomenorrhea), not pregnant and with no history of ovarian surgery included in this study. Exclusion criteria: Women more than 40 years, pregnant women, women with a polycystic ovarian syndrome or any ovulatory dysfunction, women with a history of endometriosis, women with a history of tubal surgery other than salpingectomy excluded from this study. At the 3rd day of menstrual cycle, a 10-mL blood sample was drawn from both groups (case and control). The sample centrifuged for 5 minutes; the supernatant serum was collected and stored at -20 C. follicle stimulating hormone (FSH) level was measured with Gamma counter which uses Radio-immunoassay. Anti-Müllerian hormone and inhibin B levels measured by using special kits. This kit uses enzyme-linked immune sorbent assay (ELISA) based on biotin double antibody sandwich technology. Data analyzed using Statistical Package for Social Science (SPSS) version 20, continuous variables presented as a mean and standard deviation and discrete variables presented as numbers and percentages. Chi-square test and T-test used to verify the significance of observed findings. Findings with a P value less than 0.05 considered statistically significant.

RESULTS

The mean age of the women was 27.8 ± 3.5 (range; 20 – 34) years in salpingectomy group and 28.3 ± 4.2 (range; 20 – 36) years in the control group, additionally, the majority of the women in both studied groups aged 30 years or less. No statistically significant differences in age had found between both groups, P = 0.53. As is shown in table 1, the comparison of mean FSH levels between both studied groups revealed that the mean FSH levels of women in salpingectomy group was significantly higher than that in controls, (7.9 ± 1.4) mIU/mL and (7.3 ± 1.2) mIU/mL, respectively, (P= 0.023). While anti Müllerian hormone (AMH) and inhibin B was significantly lower in salpingectomy group, compare to control.

Table 1: Comparison of mean FSH, inhibin B, and AMH levels between the studied groups

Variables	Salpingectomy group (n=50)	Control group (n=50)	P value
FSH (mIU/mL), Mean ± SD	7.9 ± 1.4	7.3 ± 1.2	0.023
Inhibin B (pg/ml) , Mean ± SD	309.5 ± 208.8	414.1 ± 288.9	0.041
AMH (ng/ml) , Mean ± SD	4.4 ± 1.0	7.6 ± 3.6	0.001
SD: standard deviation			

Further analysis was performed to assess the inter-correlation between the studied parameters, FSH, AMH and Inhibin B, in both studied groups separately as illustrated in table 2.

Table 2: Correlation analysis matrix for the inter-correlation between AMH, Inhibin B, and FSH stratified by groups

Group	Parameter	AMH		Inhibin B	
		r	P value	r	P value
Salpingectomy group (n=50)	AMH	-	-	0.502	0.001
	FSH	-0.27	0.030	-0.496	0.001
Control group (n=50)	AMH	-	-	0.770	0.001
	FSH	-0.87	0.001	- 0.433	0.002
r: correlation coefficient					

Further correlation analysis made for the correlation of each of the studied parameters and the age of the participant. In salpingectomy group, a direct (positive) correlation had been found between FSH and age of the patients, (r = 0.71, P = 0.001), negative correlation between AMH and age (r = - 0.095) however it was statistically insignificant, (P>0.05) and an inverse correlation between Inhibin B and the age (r = -0.46, P = 0.001). In control group age was significantly and positively correlated with FSH (r = 0.78, P = 0.001), inversely correlated with AMH (r = - 0.66, P=0.001) and inversely correlated with inhibin B but not significant, (r = - 0.26, P>0.05), as illustrated in table 3.

Table 3: Correlation of age of women with FSH, AMH and Inhibin B in both studied group

Groups		r	P value
Salpingectomy group (n=50)	FSH	0.710	0.001
	AMH	-0.095	0.510
	Inhibin B	-0.460	0.001
Control group(n=50)	FSH	0.780	0.001
	AMH	-0.660	0.001
	Inhibin B	-0.260	0.074
r: Pearson Correlation coefficient			

DISCUSSION

The negative effect of salpingectomy on the ovarian response is not fully understood, although it is possible that unilateral or bilateral removal of the fallopian tubes partly disrupts the ovarian blood supply. [19] In the current study, the age was not statistically different between both groups, although it was slightly higher in control 28.3 years versus 27.8 years. The mean age was lower than reported by Nouh et al. in which the mean age group of the patients with salpingectomy was 41.4 ± 1.5 years, [20] also it was less than that reported by Kamal et al. [21] in which the mean age group was 34.4 ± 3.6 years. Also, it is less than that found by Xu-ping et al., [22] on their study with mean age of 33 years in all studied groups. [22] This difference in mean age in our study attributed to the inclusion criteria that chosen below 40 years.

In the current study mean FSH level in salpingectomy group was significantly higher than in controls and this in agreement with Iwase A et al., in which the FSH concentrations were significantly higher in the salpingectomy group after surgery when compared to another group. [23] Also, it agrees with that result reported

by Kamal et al., [21] in which they found that FSH value significantly increased after laparoscopic salpingectomy. Moreover, it was in agreement with Xu-ping et al., [22] when the mean FSH level was significantly higher in women with salpingectomy as compared with those without salpingectomy. On the other hand, it disagreed with Sezik et al., [24] in their study which examined the effect of salpingectomy on ovarian reserve and stromal blood flow after abdominal hysterectomy. This study had a small sample size (24 subjects), and they did not find a difference in ovarian reserve among women who underwent salpingectomy versus those that did not. Also, it disagrees to that registered by Nouh et al. study, [20] in which they mentioned that FSH is not significantly changed six months postoperatively in both groups, this attributed to the small sample size which was 25 subjects.

Serum anti Müllerian hormone (AMH) level would appear to better reflect the level of ovarian aging than other known markers of ovarian reserve, as basal serum FSH level, inhibin B level, and antral follicle. [25] In the current study, the level of Anti-Müllerian hormone in salpingectomy group was significantly lower than those in control group, (P= 0.001). AMH is secreted primarily by granulocytes of preantral follicles and small antral follicles. With a decreased ovarian blood supply after salpingectomy, the recruitment and development of follicles are compromised, leading to reduced AMH secretion from follicular granulocytes. The previous finding is disagreeing to that found by Singer et al., [26] when the level of the AMH is not affected by salpingectomy this is because only six patients in this study treated surgically and 29 of them treated medically by methotrexate drug. [26] Moreover, it disagrees with that revealed by Findley et al., [27] when the mean AMH levels were not significantly different; however they only examined levels at three months after surgery and small sample size in which only 30 subjects for both groups. [27] The results of the current study agreeing to that revealed by Xu-ping et al., [22] in which they reported that AMH level in women with salpingectomy is lower than that without salpingectomy.

Recent studies have shown that inhibin B concentrations may reflect ovarian function. But an absolute cut-off point has not yet been found. [28] In the current study, the level of inhibin B was significantly lower in salpingectomy group than controls, (P=0.041). The presumed linkage in the relationship between baseline FSH and random AMH is that both hormones are indicators of ovarian reserve. In the current study in salpingectomy group, AMH was inversely and significantly correlated with FSH, which was in agreement with Bala et al., study. [29]

CONCLUSIONS

Salpingectomy is associated with decreased AMH and inhibin B levels, while it associated with increased FSH level. These results suggest that salpingectomy associated with decreased ovarian reserve.

Conflict of Interest : None

Ethical Clearance: Informed written consent was obtained from all the participants in the study, and the study and all its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. The study was approved by Gynecology & Obstetric department of Baghdad medical college.

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The Effect of Transformational Leadership and Organizational Climate with Satisfaction Partnership at Hospital RSUD Pariaman Indonesia in 2017

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ABSTRACT

The nurse has *Organizational citizenship behavior (OCB)* that greatly needed because OCB involves some behavior, for example behavior helping others, active in activities organization, act that appropiate with procedure and give service to everyone. The aims of this study was to analyze the effect of transformational leadership and organizational climate to *organizational citizenship behavior* and job satisfaction as mediating variables on nurses implementing in RSUD Pariaman. The sample in this study were 54 nurses implementers. In Choosing the sample in this research used*TotalSampling*technique.The Results of this research is there is a significant influence and positive between transformational leadership variables (t-statistical test 4.87) and climate organization (t-statistical test 8.27) against OCB. There is a significant influence and positive between transformational leadership variables (t-statistics 3.59) and organizational climate (statistical t test 4.71) on job satisfaction. There is a significant influence and positive between variable satisfaction work against OCB (t-statistical test of 5.49). It is expected that the head of the room can change the way the nurses work to be better by establishing good cooperation and communication to their subordinates and motivating them so that the nurses will be satisfied with the work done.

Keywords: *Transformational Leadership, Organizational Climate, Job Satisfaction, organizational citizenship behavior*

INTRODUCTION

Nurses are the spearhead of whether good or not health services are provided to patients. This is due to the dominant number (50-60%) of all personnel available, and the duty to care and keep the patient for 24 hours a day. Nurses are required to be able to provide first aid to patients with responsiveness without complaining no matter the situations and conditions of employment. Such this demands make the nurse as one of the elements of the hospital in desperate need of behaviors from the *Organizational Citizenship Behavior* (OCB) dimension [(1)].

RESEARCH METHODOLOGY

This research is a correlation research with cross sectional design. The population in this study is all nurses implementing RSUD Pariaman which amounted to 97 people. The samples in this study were 54 nurses. Sampling of this research using *Total Sampling* technique.

RESULTOF THE RESEARCH

The results show that a small portion nurses aged 35-40 years (40.7%), sex nurses most of the women 44 nurses (81.5%) and nursing education a small part was Diploma 26 nurses (48.1%).

Table 1: The Influence of Transformational Leadership on*Organizational Citizenship Behavior* (OCB) (Direct Effect)

Direct Effect	Latent Variable Correlation	Path Coefficient	Big Influence (%)	t- Statistics	Information
Leadership toward OCB	0.780981	0.239528	18.71%	4.871024	Significant and Positive

Table 1 shows that the value of t-count of 4.871024 where larger than 2.00 tables (df = 53), it can be concluded that the first hypothesis accepted is "There is a significant and positive influence between transformational leadership variables on *organizational citizenship behavior* (OCB) "

Table 2: The Influence of Organizational Climate on *Organizational Citizenship Behavior* (OCB) (Direct Effect)

Direct Effect	Latent Variable Correlation	Path Coefficient	Big Influence (%)	t- Statistics	Information
Climate Organization Against OCB	0.807388	0.399714	32.27%	8.273330	Significant and positive

Table 2 shows that the value of t count equal to 8.273330 which higher than t-table of 2.00 (df = 53), it can be concluded that the second hypothesis is accepted that "There is a significant and positive influence between the variables of organizational climate to *organizational citizenship behavior* (OCB) ".

Table 3: The Influence of Transformational Leadership on Job Satisfaction (Direct Effect)

Direct Effect	*Latent Variable Correlation*	*Path Coefficient*	Big Influence (%)	*t- Statistics*	Information
Transformational Leadership on Job Satisfaction	0.696590	0.333451	23.23%	3.597432	signore and Positive

Table 3 shows that the value of t-count is 3.597432 which is bigger than t-table of 2.00 (df = 53), it can be concluded that the third hypothesis accepted is "There is a significant and positive influence between transformational leadership variable to satisfaction work".

Table 4 : The Influence of Organizational Climate on Job Satisfaction (Direct Effect)

Direct Effect	*Latent Variable Correlation*	*Path Coefficient*	Big Influence (%)	*t- Statistics*	Information
Organizational Climate of Satisfaction	0.709360	0.423302	30.03%	4.714560	Significant and Positive

Table 4 shows that the t-count value of 4.714560 which is greater than the t-table of 2.00 (df = 53), it can be concluded that the fourth hypothesis accepted "There is a significant and positive influence between organizational climate variables on satisfaction work " .

Table 5: Effect of Job Satisfaction on*Organizational Citizenship Behavior*(OCB) (Direct Effect)

Direct Effect	*Latent Variable Correlation*	*Path Coefficient*	Big Influence (%)	*t- Statistics*	Keterangan
Job Satisfaction Against OCB	0.735425	0.285031	20.96%	5.495261	Significant and Positive

Table 5 shows that the t-count value of 5.495261 which is greater than t-table of 2.00 (df = 53), it can be concluded that the fifth hypothesis accepted "There is a significant and positive influence between job satisfaction variable on *organizational citizenship behavior* (OCB) ".

Table 6 : The Influence of Transformational Leadership on*Organizational Citizenship Behavior* (OCB) Through Job Satisfaction (Indirect Effect)

Effects of causality	*Path Coefficient*	Big Influence (%)	Conclusion
The Influence of Transformation Leadership to OCB through Job Satisfaction	0.095044	4.87%	Influence, Not Significant and Positive

Table 6 shows the influence of transformational leadership on OCB through job satisfaction by 4.87% where significant influence is not less than 5% with the path coefficient value of 0.095044, it can be concluded that the sixth hypothesis is accepted "There is a positive influence between the variables of leadership transformational to *organizational citizenship behavior* (OCB) through job satisfaction ".

DISCUSSION

A. The Influence of Transformational Leadership And Organizational Climate To*Organizational Citizenship Behavior*(OCB)

Based on the result of this research, the influence of transformational leadership toward OCB got the value of T statistic (4,871024) bigger than t table equal to 2,00 (df = 53) and its influence (18,71%) means that there is significant and positive influence between leadership variable transformational to *organizational citizenship behavior* (OCB).

Leaders who are transformational can make their subordinates work harder and want to work more than what they should be doing. Bass in Luthans (2006) states that transformational leadership can make the subordinates become more engaged and concerned about their work, paying more attention and time to their work, and becoming less attentive to his personal interests [(2)].

B. The Influence of Transformational Leadership And Organizational Climate On Job Satisfaction

Based on the results of this research, the influence of transforational leadership on Job Satisfaction, the value of T statistic (3.597432) is greater than t table of 2.00 (df = 53) and the influence (23.23%) means that there is a significant and positive influence between variables transformational leadership towards job satisfaction. Job satisfaction has a relationship and can be influenced by many things, one of them is transformational leadership. In Hezberg's theory of motivation, especially hygiene theory, if extrinsic factors such as corporate leadership, supervision, interpersonal relations, and working conditions are cannot fulfil, it will lead to dissatisfaction and for intrinsic factors or motivating factors such as achievement, job recognition, self-esteem, it will lead to job satisfaction [(3)].

C. The Effect of Job Satisfaction on*Organizational Citizenship Behavior* (OCB)

Based on the result of this research got the value of T statistic (5,495261) bigger than t table equal to 2,00 (df = 53) and big influence (20,96%) meaning there is significant and positive influence between job satisfaction variable to *organizational citizenship*

behavior (OCB). Research conducted by Hasanbasri (2007), suggests that there is a significant positive relationship between job satisfaction with OCB [4]. Even Kelana (2009) argued that job satisfaction is the most dominant variable affecting OCB [5].

In a number of literature explains that OCB is an individual behavior that voluntarily performs tasks outside of its responsibilities and positively impacts the organization or to its group members [6]. Satisfied employees are more likely to do their work than the required *job-description* , because they want to reply to their positive work experience [7].

D. The Influence of Transformational Leadership on*Organizational Citizenship Behavior* (OCB) Through Job Satisfaction

Based on the result of the research, the influence of 4.87%, where the influence is not significant less than 5% with the parameter coefficient value 0,095044 , it can be concluded that there is no significant and positive influence between transformational leadership variable to *organizational citizenship behavior* (OCB) through job satisfaction. From the test of mediation effect test, the value of *variance accounted for* (VAF) is 28,41%, means that job satisfaction variable can be categorized as partial premediation with indirect effect value 0,095044 and direct influence 0,239528. It can be interpreted that the effect of transformational leadership will have an impact on the emergence of job satisfaction raised by nurses, and then it will only cause OCB. The effects of transformational leadership do not directly affect OCB because nurses will feel satisfied in advance with their work and will only reinforce the OCB's attitude.

E. The Influence of Organizational Climate on *Organizational Citizenship Behavior* (OCB) Through Job Satisfaction

Based on the result of the research, it is found that the influence of 6.29% where the influence is bigger than 5% with the parameter coefficient value 0.120654, it can be concluded that there is a significant and positive influence between *organizational citizenship behavior* (OCB) organizational climate variable through job satisfaction. From the test of mediation effect test, the value of *variance accounted for* (VAF) is 23,19%, means that job satisfaction variable can be categorized as partial premediation with indirect effect value 0,120654 and direct influence 0,399714.

Organizational climate can be a powerful cause of the development of OCB within an organization. In a positive organizational climate, employees feel more willing to do their work than what is required in job descriptions, and will always support the organization's goals if they are treated by the leader with fair and with full awareness and believe that they are treated fairly by the organization. Based on the above analysis, the researcher assumes that the nurse will elicit OCB behavior if there is indirect effect from organizational climate that will make the nurses feel satisfied with their work. Normal expectations in their work. In addition, satisfied employees may provide more roles as they respond to their positive experiences.

CONCLUSION

There is a significant and positive influence between transformational leadership variables, organizational climate variables, on organizational citizenship behavior (OCB)

Conflict of Interest: No conflict of interest arose in this study

Source of Finding: This study was conducted using a source of funds derived from the researcher himself

Ethical Clearance: This study has passed of the medical reseach ethics of the Dr. M. Djamil Hospital Padang Indonesian.

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The Correlation between Age, Gender, and Nutritional Status with Pesticide Poisoning at Holtikultura Farmers in Cikajang Sub-District, Garut District, West Java

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ABSTRACT

Pesticides are chemicals used to control agricultural pests. In addition to provide benefits, Pesticides use also affects the environment, as well as poisoning to humans. This study aimed to analyze the correlation between farmers' internal factors such as age, gender, nutritional status, and smoking habits with pesticide poisoning. The design was cross-sectional, with analysis using T-independent test. The sample of this research is 82 farmers holtikltura located in District Cikajang, Garut Sub-district, West Java. The result of bivariate test showed significant difference of cholinesterase enzyme on gender variable (p = 0,037) and nutritional status (0.001) and showed no correlation between age and pesticide poisoning at farmer (0,222). The conclusion of this research is gender and nutritional status of farmer influence the status of pesticide poisoning based on cholinesterase enzyme concentration. Further research is expected to analyze other variables related to pesticide poisoning and measure the concentration of pesticide exposure in free air when spraying.

Keywords: *pesticide, pesticide poisonong, cholinesterase.*

INTRODUCTION

Pesticides are chemicals used to kill pests (rats, insects, plants) that negatively affect plant growth. In addition to its benefits to agriculture, the use of pesticides has the potential to cause toxic effects to other organisms including human and environment[1]. Exposure to pesticides in certain types and amounts may pose a health risk of respiratory distress, diabetes, depression, neurological disorders, and cancer. The risk of health effects will be the higher to groups of people who exposed directly by pesticides[2]. Acute effects of pesticide exposure might include fatigue, headache, rough skin, decreased concentration, respiratory distress, nausea, tremor, panic, cramps, and in some cases may lead to coma to death. Meanwhile, the chronic effects of pesticide exposure according to some studies include sarcomas, multiple myeloma, prostate cancer, pancreas, lung, ovary, breast, testes, liver, kidney, intestinal, and brain[3].

The poisoning caused by pesticide exposure in the world is estimated to reach 250,000 deaths annually[4]. According to a report from the Pesticide Action Network (PAN), WHO found that there were 735,000 cases of specific chronic diseases caused by pesticide poisoning each year. Rhalem et al reported 2,609 cases of poisoning in Morocco in the period 1982-2007. There were also reported cases of poisoning in Latin America in Bolivia with 274 poisoning cases which 13 died from Numbela's research in 2008. Meanwhile, cases of pesticide poisoning have also been reported in the Asian region covering Bangladesh, Cambodia, China, Japan, Korea, India, Malaysia, Philippines, Sri Lanka, Vietnam and Indonesia[5].

Garut District is one of the districts located in West Java Province with an area of 3,065.19 km². The strategic location of Garut with the capital of West Java province makes it as one of the suppliers, including food and agriculture needs[6]. Cikajang sub-district is one of the

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areas of vegetable suppliers with agricultural land area reaching 503.81 km2 where 41% of the population work as farmers[7]. Based on research conducted by Luthfiah in 2016, it found pesticide residues on tomato farm products grown in the Village Cikandang which is one of the villages in the Cikajang sub-district. In addition, the frequency of farmers exposed to pesticides reaches an average of 351 days / year [8], which would pose a risk for pesticide poisoning for farmers.

Pesticides that enter the body will go through a series of toxicological mechanisms. The most commonly exposed pesticides and impacts on human health are organophosphate and carbamate pesticides. Organophosphate pesticides that have entered the body will accumulate rapidly in fatty tissue, liver, kidneys and salivary glands. These compounds will be stored extensively in fats that can cause prolonged toxic effects and clinical relapse. The organophosphate metabolite product will largely be eliminated through urine, slightly in the feces and air of the exhalation[9]. Meanwhile, carbamate type pesticides that enter the body will be enzymatically hydrolyzed by the liver. The degradation product of the process will then be excreted by the kidneys and liver[10].

This study aims to analyze the effect of age, sex, and nutritional status on the incidence of pesticide poisoning based on the concentration of cholinesterase enzyme in horticultural farmers. The results of this study are expected to be used as consideration for the government in making policies related to the control of pesticide use. In addition, the community, especially farmers can be more careful in using pesticides.

METHOD

Subject of Research

Respondents of this research were horticulture farmers who are in charge of spraying pesticides, with the number of 82 people (68 men and 14 women). Respondents were obtained by using random sampling method involving 5 of 12 villages in Cikajang Sub-District. The selection of 5 villages was determined based on the location of the village that is easily accessible by researchers, namely Cikajang Village, Simpang, Padasuka, Cikandang, and Margamulya.

Sampel of Research

Each respondent will take a blood sample of 5 ml for then separated the blood component using centrifuge and the serum taken as much as 1 ml. Blood sampling and serum taken by laboratory staff from Health Laboratory of Garut. The picked serum is then stored at 2-80C using a cooler box and jelly ice pack to maintain its durability until it reaches Jakarta for further analysis. This study used the services of the Health Laboratory of Jakarta City to analyze cholinesterase levels of serum samples that had been collected. Testing cholinesterase was performed using colorimetric method.

Analysis

Cholinesterase enzyme levels in the blood of farmers were used as biomarkers of pesticide poisoning. Data collected other than pesticide poisoning data are about age, gender, height and weight. The data obtained then analyzed statistically using data processing program. The data were tested with bivariate analysis by using Independent T-test method to see the relationship between dependent variable consisting of age, gender, and nutritional status with independent variable in the form of poisoning status of pesticide and comparing the mean of inter-category variables.

RESULT

The status of pesticide poisoning is determined based on the cholinesterase enzyme levels in the peasant's blood that refer to the normal value of laboratory reference. The normal reference value of cholinesterase enzyme levels for women is 4,300-11,500 U / L and men is 5,400-13,200 U / L. The cholinesterase enzyme levels within the range are categorized as normal samples, whereas if out of range is categorized as an abnormal sample. Data on the status of pesticide poisoning in the respondents can be seen in Table 1.

Table 1. Status of Pesticide Poisoning Based on Cholinesterase Enzyme Concentration on Respondent

	Frequency	Persentage (%)
Normal	81	98,78
Abnormal	1	1,22

Data of frequency, average of cholinesterase, and

p value to see the relationship between dependent and independent variables are presented in Table 2. Data of age indicates that respondents in the age group between 17-54 years have higher average of cholinesterase compared to above age group 55 years old (8468.14 ± 1506,06 vs. 7960,29 ± 1550,37; p = 0,222). In the gender variables, female respondents had higher mean cholinesterase than men (9131,71 ± 1350,68 vs 8204,56 ± 1513,15; p = 0,037). Meanwhile, in nutritional status variables, respondents with normal nutritional status had a lower mean cholinesterase than the respondents group with abnormal nutritional status (8013,53 ± 1533,65 vs 9207,04 ± 1120,01; p = 0,001) .

Nutritional status is determined based on the value of the Body Mass Index (BMI) of respondents. The value of BMI is obtained by calculating a formula involving height and weight. The BMI formula is

Information:

BMI = Body Mass Index (kg/m^2)

W = Weight (kg)

H = Height (m)

Samples are normally categorized if BMI values are in the range 18.5-25 kg/m^2. Whereas if outside the range it will be categorized as an abnormal sample.

Table 2. The result of bivariate analysis of internal risk factors to pesticide poisoning on horticultural farmers

Variable of Research	Category	Frequency	Average of cholineseterase	SD	P value
Age	17-54 years old	65	8468,14	1506,06	0,222
	≥ 55 years old	17	7960,29	1550,37	
Gender	Female	14	9131,71	1350,68	0,037
	Male	68	8204,56	1513,15	
Nutritional Status	Normal	58	8013,53	1533,65	0,001
	Abnormal	24	9207,04	1120,01	

DISCUSSION

Status of Pesticide Poisoning

Cholinesterase enzyme concentration is a biomarker used by researchers to describe the level of pesticide poisoning due to exposure of pesticide spraying activities. The lower the concentration of cholinesterase in the peasant body, the pesticide poisoning status will be more severe.

The results of assessment of farm poisoning status based on cholinesterase concentration in the blood of this study were very low. Of the 82 respondents who measured cholinesterase concentrations, there was only 1 person (1.22%) indicated to be poisoned by pesticides because they have cholinesterase concentrations below the normal reference value. This is in accordance with the enero of Ali in 2015 which also found only one respondent indicated poisoning from a total of 32 samples at the technician at a pest control company in Jakarta. This is because the respondents whose blood was taken were not entirely in the spraying period of pesticides. In fact, the concentration of cholinesterase in the blood may return to normal if an exposed person rests from pesticide-related activities within a period of more than a week[11].

Correlation between Age and Pesticide Poisoning

The result of bivariate test with independent t test showed that at α = 5% there was no significant difference between average of cholinesterase content in the group of productive age and group of older age (p = 0,222). The statistical test showed that the age group over 55 years had lower cholinesterase levels, but the difference between the two categories was very small

(507.85 U/L) so assuming no significant correlation between age variables and pesticide poisoning. This result is consistent with studies conducted by Zakaria in 2007 and Zuraida in 2012 showing no association between age and pesticide poisoning[12, 13]. Meanwhile, a study conducted by Ali in 2015 showed a significant relationship between age and pesticide poisoning with a value of p = 0.036[11].

Age associated with the body's ability to perform metabolic functions and immune mechanisms against certain agents. Older age will have an impact on the weakness of the body in warding off foreign agents entering the body[14]. This is because older farmers are experiencing physical limitations, especially in terms of energy that affect their ability to work for long periods of time.

The National Pesticides Information Center (NPIC) says that the elderly age group tends to be more sensitive to the risk of pesticide poisoning[15]. This is because the ability of the kidneys to remove toxins from the body has decreased with age. This situation will eventually lead to accumulation of pesticides in the body and risk of causing certain health disorders[16].

Gender

Based on the result of T-independent statistic test, obtained p value = 0,037 which mean there is significant difference between average of cholinesterase level on female and male respondent. The result of statistical test showed that male respondents had lower mean cholinesterase (8204,26 U/L ± 1513,15 U/L) than female respondents (9131,71 U/L ± 1350,68 U/L). This indicates that men tend to be more at risk of pesticide poisoning than women. The results of this study are in accordance with the research of Afriyanto (2008) and Rustia (2009) which shows that the average female respondent's cholinesterase is higher than that of men[14, 17]. In a study conducted by Sidell F R and Kaminskis A in 1975 also found that cholinesterase activity in erythrocytes was higher in women than in men[18].

The average difference of cholinesterase enzyme levels in women and men is influenced by various factors. Factors such as differences in workplace exposure are among the factors that influence gender variables. Exposure received by men in the workplace is considered much greater because it is more of a heavy and risky act than women[19]. Redderson in Sidel F R and Kaminskis A mentioned that the high activity of cholinesterase in women can be caused by the steroid hormone in women that encourages the liver to release the enzyme[18]. In addition, the use of oral contraception will also affect cholinesterase activity to be higher[20], so it is a confounder factor in this study.

Nutritional Status

Based on statistical test, it was found that there was significant difference of mean cholinesterase enzyme level in the group with normal and abnormal nutritional status with p value = 0.001. Rachmadi 1985 in Ali 2015 states that nutritional status affects cholinesterase enzyme activity[11]. In a study conducted by Marsaulina and Wahyuni in 2007 with a sample of horticultural farmers also showed the results of the relationship between poor nutritional status with the incidence of pesticide poisoning with p value = 0.019. The study concluded that individuals with abnormal nutritional status were 2.2 times more likely to have pesticide poisoning than those with normal nutritional status[21]. However, these results are not suitable according to research conducted by Afriyanto with a sample of sprayer farmers in 2008. Determination of nutritional status is not only determined based on the value of BMIT alone, but also need to assess the genetic and dietary factors of a person[14].

Nutritional status also affects the immune system of farmers. Farmers who are constantly exposed to pesticides in unhealthy body condition will decrease initiative and sensitivity to foreign body infections[21].

CONCLUSION

The result of statistical test proves the correlation of gender and nutritional status to pesticide poisoning measured by cholinesterase enzyme concentration. Meanwhile, age variable has no correlation with pesticide poisoning based on statistical test. The weakness in this study is there is no measurement of the amount of exposure in the environment when farmers are spraying. For the further study, it is expected to measure the concentration of exposure to pesticides in the air. In addition, studies with different variables and methods are also needed to strengthen the results of this study.

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Etchical Approval: The study was approved by the Universitas Indonesia Faculty of Public Health Institutional Review Board (IRB) with the letter number of 158/UN2.F10/PPM.00.02/2017.

Competing Interest: There is no competing interest or conflict of interest on this research article

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The Relationship between Self-Efficacy and Social Support with Effective Breastfeeding among Postpartum Mothers in Padang West Sumatera Tahun 2017

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ABSTRACT

Background: Many opportunity gets from breastfeeding, not only for the baby but also for mother. In fact, the breastfeeding rate remains low year by year. The mother's circumstance and herself might influence this rate.

Objective: The objective of this study is to identify the relationship between self-efficacy and social support with effective breastfeeding among mother in Padang, West Sumatera.

Method: This study was using correlation with cross sectional study. It was conducted with 397 mothers who have baby with age less than months. Social support and self-efficacy was investigated by using questionnaires and *LATCH breastfeeding assessment tools* for Effective Breastfeeding. Data were analyzed using Spearman rho Correlation.

Results: There was significant correlation between social support: family's and health workers' and mother's self-efficacy on effective breastfeeding with $p < 0.05$.

Conclusion: More than 50% mother did breastfeeding to their baby. Family's and health workers' support and mother's self- efficacy has relation with effective breastfeeding. It means support from the people surrounding of mother important in order to do effective breastfeeding.

Keywords*: effective breastfeeding, social support, self-efficacy*

INTRODUCTION

Breastfeeding is the process of giving breast milk for the baby. Breastfeeding should be done as soon as possible after the baby is born. This circumstance is done because breast milk is the only best nutrition for infants up to the age of 6 months. Furthermore, the baby is given additional food along with breast milk until the age of the baby reaches 2 years. Consequently, WHO recommends exclusive breastfeeding until the age of 6 months and with additional food/beverages until 2-years-old in an effort to optimize the child health [1, 2]. Breastfeeding the babies will be advantageous to everyone, including the babies, mothers, families, communities, and countries, such as preventing infant illness, improving baby's intelligence, reducing risk and lessening medicating costs [3-5].

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METHOD

Cross-sectional design is applied throughout this study. The researchers used accidental sampling with a total result of 397 breastfeeding mothers, and these respondents were distributed from all public health centers in Padang. The ethics approval was granted from Ethical consideration. The respondents in this study received adequate information from the researcher about the purpose, procedures, risks and possible benefits of the study. Confidentiality of the respondent's identity and their answers were maintained throughout the study. The respondents in this study received a set of questionnaires, and they were distributed to the respondents before their healthcare services began.

RESULT

Table 1: The Relationship of Self-efficacy with Effective Breastfeeding

Self-efficacy	Effective breastfeeding		Total	P Value
	Yes	No		
High	219 (92%)	18 (8%)	237 (100%)	0.001
Low	80 (50%)	80 (50%)	160 (100%)	

Table 1 shows that respondents who give effective breastfeeding, 92% have high self-efficacy and 50% with low self-efficacy with p = 0.001

Table 2: The Relationship of Husband's Support with Effective Breastfeeding

Husband's support	Effective breastfeeding		Total	P Value
	Yes	No		
High	180 (87%)	27 (13%)	207 (100%)	0.002
Low	119 (63%)	71 (37%)	190 (100%)	

Table 2 shows that respondents who give effective breastfeeding, 87% of them get the husband's support and 63% have low support with p = 0.002

Table 3: The Relationship of Health Cadre's Support with Effective Breastfeeding

Cadres' Support	Effective Breastfeeding		Total	P Value
	Yes	No		
High	101 (83%)	20 (17%)	121 (100%)	0.072
Low	198 (72%)	78 (28%)	276 (100%)	

Table 3 shows respondents who give effective breastfeeding, 83% get high support from health cadre's and 72% have low support with p value = 0.072

Table 4: The Relationship of Health Workers' Support with Effective Breastfeeding

Health Workers' Support	Effective Breastfeeding		Total	P Value
	Yes	No		
High	224 (75%)	76 (25%)	300 (100%)	0,035
Low	75 (77%)	22 (23%)	97 (100%)	

Table 4 shows respondents who give effective breastfeeding, 75% receive high support from health workers and 77% get low support with p value = 0.035

Table 5: The Relationship of Peer's Support with Effective Breastfeeding

Peer's Support	Effective Breastfeeding		Total	P Value
	Yes	No		
High	208 (72%)	82 (28%)	290 (100%)	0.066
Low	91 (85%)	16 (15%)	107 (100%)	

Table 5 shows respondents who give effective breastfeeding, 72% receive high support from their friends and 85% get low support with p value = 0.066

DISCUSSIONS

The Relationship of Self-Efficacy with Effective Breastfeeding

The results of this study indicate that around 237 (60%) of respondents have high self-efficacy in providing exclusive breastfeeding and 160 respondents (40%) with low self-efficacy. According to Bandura (1997), self-efficacy is a theory that heads for behavior. Self-efficacy transition will have a positive impact on behavior but there are times when self-efficacy will have negative effects. The expectations of high self-efficacy actually can be counterproductive. A person who possesses high self-efficacy can cause that individual to have the self-assurance and the effort to show up optimally[6]. Bivariate analysis by using chi-square test got result of p-value = 0,001 (p <0,05). Based on this, statistically, there was a meaningful relationship between self-efficacy with effective breastfeeding. This is supported by research that done in Iran[7] The research was shown that self efficacy has strong relationship with breastfeeding.

The Relationship of Husband's Support with Effective Breastfeeding

The results of this study indicated that 207 (52%) of respondents had a high support of husbands in breastfeeding and 190 (48%) of them had low husbands' support. Bivariate analysis by using chi-square test got result of p-value = 0,002 (p <0,05). Based on this, statistically, there was a significant relationship between the support of husbands with effective breastfeeding.

One of the closest support obtained by the mother is the support of the husband. Husband's support is the most important part in the success or failure of breastfeeding because the husband determines the smoothness of knowledge of breast milk (let-down reflex) which is strongly influenced by the emotional state and feelings of the mother [8]. The greater the support gained to continue breastfeeding, the greater the ability of the mother to keep going on breastfeeding [9, 10].

Husband's support is a proponent factor in the success of exclusive breastfeeding. This support is either an emotional or psychological activity given to a breastfeeding mother in presenting her breast milk. It is related to thoughts, feelings, and sensations that can boost the production of breast milk[8]. The greater the support obtain to continue the breastfeeding, the greater the ability and the mother's self-esteem to keep going on that. Either support from husband or family has an essential influence because a mother who gets support from her husband, mother, or sister will resist in breastfeeding and is not worried to change into formula milk [8].

The Support of Health Cadre's in Effective Breastfeeding

The results of this study showed that 121 respondents (30%) received high support from health cadres in effective brestfeeding and respondents who had the low breastfeeding support were 276 respondents (70%). It is necessary to increase awareness, understanding, and knowledge of *posyandu* (health care center for mothers and babies) cadres about the importance of exclusive breastfeeding as well as to optimize the ability and skill of *posyandu* cadres in order to give health education about exclusive breastfeeding in every *posyandu* domain.

Based on the result of bivariate analysis by using chi-square test got a result of p-value = 0,072 (p <0,05). Statistically, there was no meaningful relationship between health cadres and effective breastfeeding. Breastfeeding is a multidimensional health behavior that is influenced by the interaction of demographic, biological, psychological, and social factors [11]. Health behavior is a person's response to stimuli or objects

which related to illness and disease, health service system, environment and others [9].

The Relationship of Health Workers with Effective Breastfeeding

The results of this study indicated that 300 people (76%), which were the majority of respondents, got high support from health workers to breastfeeding and there were 97 (24%) respondents who got low support. The support of health workers is the physical and psychological comfort, attention, appreciation, or other forms of aids that received by individuals from the health workers [11]. Health workers' support can be emotional comfort, rewarding, instrumental, and informational support [12, 13]. Health workers are a source of social support coming from other individuals who rarely support and have a very rapid changing role. Supporting mothers becomes a significant factor in exclusive breastfeeding [6, 14].

Based on the result of bivariate analysis by using chi-square test got a result of p-value = 0,035 (p <0,05). Statistically, there was a meaningful relationship between health workers and effective breastfeeding. According to Green (1980) behavior is influenced by 3 circumstances, they are predisposing factors which include knowledge, attitudes, beliefs, faiths, values; enabling factors which are the physical environment, tools, and health facilities; strengthening factors either health officer's attitudes or behavior. The support of health professionals, doctors, midwives, nurses and health cadres, has an essential role in promoting the success of exclusive breastfeeding [12].

The Relationship of Peers Support with Effective Breastfeeding

The results of this study showed that 290 respondents (73%) received high support from their peers in effective breastfeeding and respondents who had the low breastfeeding support were 107 respondents (27%). Support groups are people who have the same dilemmas or goals. They gather regularly to tell each other about their difficulties, successes, news or ideas relating to the problems that they have been handling or goals to be achieved [15]. The meetings of this group are held in a friendly atmosphere, comfortable, in mutual trust and mutual respect. Through these meetings, participants will give and receive mutual support in the form of technical, moral and emotional in order to solve the problems successfully or to achieve the desired goals. The mother's support group is a particular support group which established for mothers who wish to succeed in breastfeeding optimally [16-18].

Bivariate analysis by using chi-square test got result of p-value = 0,066 (p <0,05). Based on this, statistically, there was no significant relationship between the support of peers with effective breastfeeding. Support groups are people who have the same dilemmas or goals. They gather regularly to tell each other about their difficulties, successes, news or ideas relating to the problems that they have been handling or goals to be achieved. The meetings of this group are held in a friendly atmosphere, comfortable, in mutual trust and mutual respect. Through these meetings, participants will give and receive mutual support in the form of technical, moral and emotional in order to solve the problems successfully or to achieve the desired goals. The mother's support group is a particular support group which established for mothers who wish to succeed in breastfeeding optimally [9].

CONCLUSIONS

More than 50% mother has practiced effective breastfeeding to her baby. Social support such as family's and health workers were relation with effective breastfeeding. Self-efficacy is also another factor related with effective breastfeeding with p value < 0.05.

Conflict of Interest: No conflict of interest arose in this study

Sources of Funding: This study was conducted using a source of funds derived from the researcher herself

Ethical Clearance: This research has passed from the Research Ethics Committee of Medical Faculty of Andalas University Padang Indonesia.

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Seroprevalence and Histological Study of *Toxoplasma gondii* in Chicken (*Gallus domesticus*) in Tikrit City, Iraq

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ABSTRAT

Toxoplasmosis is one of the most common zoonotic disease caused by unicellular protozoan parasite *Toxoplasma gondii* that can be infected the human and animals. Recently, in Iraq with increasing chicken meat consumption, may be as one of the sources of human infection, this study was carried out to determine the seroprevalence of *T. gondii* in chicken, and demonstrated the histological effects of parasite in infected chicken in Tikrit city and its surroundings, Iraq. One hundred and thirty seven blood samples were collected from free Range chickens to detected toxoplasmosis by using Latex agglutination test (LAT) and Enzyme Linked Immunosorbent Assay (ELISA).Organs including brain and liver were also collected for histopathological examination. Results revealed that 32.1% and 29.2% of free ranging chickens positive by LAT and ELISA tests respectively. The results showed there were no significant differences $P < 0.05$ between infection with *toxoplasmosis* and age of the animals, and their habitat using both detection methods. Histopathological studies revealed necrosed areas and inflammatory cells in brain and liver.

Keywords: *Toxoplasmosis, Chickens, seroprevalence, histopathological effects, Iraq.*

INTRODUCTION

Toxoplasmosis is a zoonotic disease of worldwide distribution caused by *Toxoplasma gondii*, an obligate intracellular protozoan with a highly broad host range that infects most warm-blooded animals including birds, humans, domestic and wild animals [1, 2].

The infections with toxoplasmosis are usually acquired by ingesting undercooked or raw meat containing tissue cysts, or by ingestion of food or water contaminated with oocysts from cat feces [3]. Though *T. gondii* can rarely cause clinical disease in chickens [4], they play an important role in the epidemiology of *T. gondii* infection because they are ground-feeding birds, and tissues of infected chickens are considered a good source of infection for cats as well as, humans and other animals [4]. Many research examined that the free-range chickens are considered as an important indicator of soil contamination with *T. gondii* oocysts whereas cats excrete environmentally resistant oocysts after consuming tissues of *T. gondii*–infected birds [5, 6].

This study aimed to investigate the seroprevalence of *Toxoplasma gondii* in chicken (*Gallus domesticus*),in Tikrit city and its surroundings and demonstrated the histological effects of parasite in infected chicken with toxoplasmosis.

MATERIALS AND METHOD

Study area and Samples Collection

Since December 2017 to April 2018, samples were obtained from Chicken farms (*Gallus domesticus*) from different regions in Tikrit city and its surroundings, Iraq. Data of each chicken was recorded on a questionnaire, the information included area, age, sex, general body conditions, symptoms, and if any of pet animals are kept. A total of (137) blood samples were collected directly

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from free range chickens (1-4 years old females), Sera were separated by using centrifuge at 1500×g for 5 min and stored at -20°C until use for diagnostic steps.

Diagnostic methods

Latex agglutination test (LAT)

Sera were examined using latex agglutination test by using commercially available kit (Spinreact, Spain). The test was performed according to the manufacturer's instructions.

Enzyme Linked Immunosorbent Assay (ELISA)

Toxoplasma IgG antibodies were detected using ELISA IgG kit (BiocheckInc, USA). The assay was performed following the instructions of the manufacturer.

Histological examination for positive chicken

Brains and liver for seroposative chickens were fixed in 10 % neutral-buffered formalin, routine procedures were made for sectioning and staining with hematoxylin and eosin H and E and examined under a light microscope.

Statistical Analysis

T he results were analyzed by SPSS software using Chi-Square test and statistical significance was considered at $p<0.05$.

RESULTS

Serological findings

The overall prevalence of *T. gondii* was 32.1 %(44 of 137) and 29.2% (40 0f 137) in chicken, using LAT and ELISA tests, respectively.

The results appeared that the infection in chicken isn't highly age-dependent, and there are no significant association between infection with *toxoplasmosis* and habitat of the animals using LAT or ELISA tests, table (1)**.**

Histological findings

Brain

According to histological examination for the seroposative chicken with *T. gondii*, in brain tissue, microglia necrosis and inflammatory cells with high activation around blood vessels was observed. High congestion in the thalamus region confirmed presence of inflammation, figure (1).

Liver

In *T.gondii* infected chicken, hepatic cell necrosis and mononuclear cell infiltrations was seen. In the periportal areas and around the central veins, lymphocytic cell infiltrations were found. A few parasitic bodies were present in the cytoplasm of the hepatocytes. Karyolysis was observed in the nuclei of necrotic hepatocytes wich appeared like cloudy swelling, figure (2 & 3).

Table 1: Prevalence of *T. gondii* infection in chickens using Latex and ELISA test according to age and habitat

Variables	Latex			ELISA		
	No. positive	**%**	P-Value	**No. positive**	**%**	P-Value
Age **≤ 1 year** **≥ 1 year**	 23 21	52.3 47.7	0.209	 25 15	 62.5 37.5	0.266
Habitat Center of the city rural areas	 26 18	 59.1 40.9	0.900	 28 12	 70 30	0.337

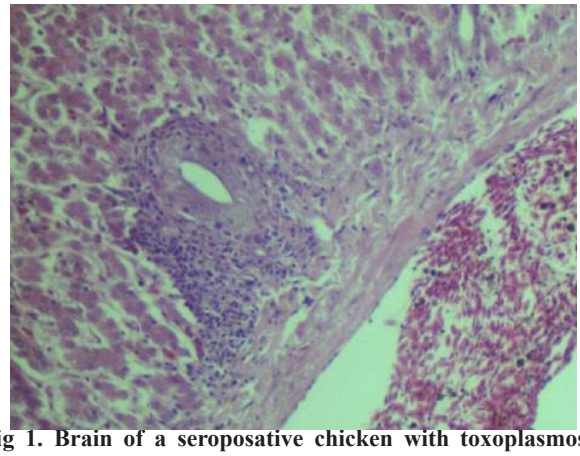

Fig 1. Brain of a seroposative chicken with toxoplasmosis. Microglia necrosis and inflammatory cells with high activation around blood vessels and high congestion in the thalamus region. H & E staining, 40X.

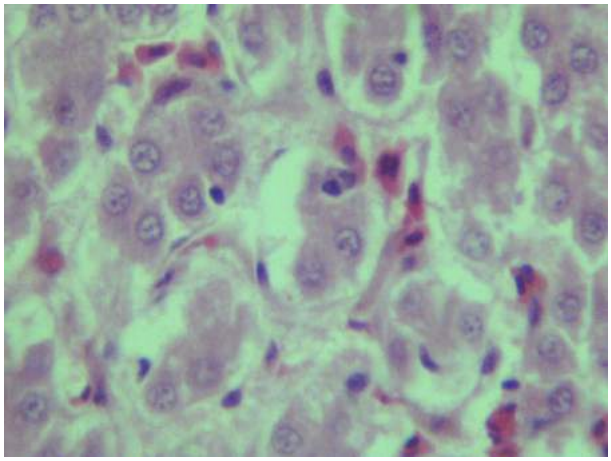

Fig 2. Liver of a seroposative chicken with toxoplasmosis. Hepatic cell necrosis and some parasitic bodies. H & E staining, 40X.

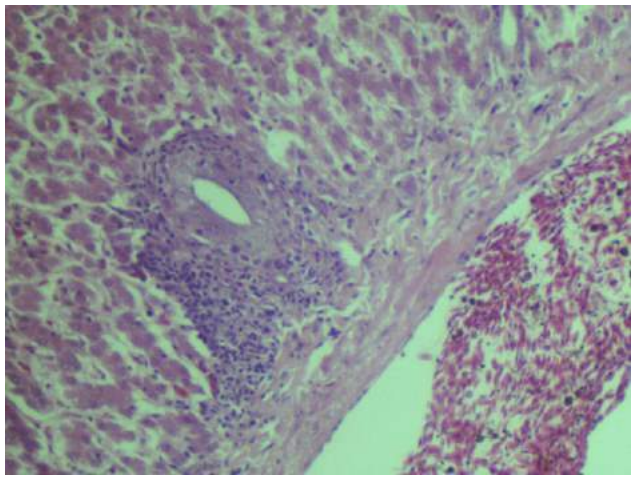

Fig 3. Liver of a seroposative chicken with toxoplasmosis. Lymphocytic cell infiltrations in periportal areas and around the central veins. H & E staining, 40X.

DISCUSSION

The results of this study proved the occurrence of considerable percentages of *T. gondii* infection in free range chickens in the studied area. Chicken plays an important role as one of the most important hosts in the epidemiology of *T.gondii* infection because it becomes infected mostly during feeding on the ground contaminated with oocysts and human may become infected with this parasite after eating undercooked infected chicken meat and its viscera [7] or maybe its eggs [4].

In the present study, both LAT and ELISA were able to detect *T. gondii* antibody in chickens. To our knowledge, limited studies were conducted for detection of *T. gondii* among chicken in Iraq, Mahmood et al. (2006) reported 81.81% in Nineveh governorate/ Iraq in Broiler chickens [8], and 60% of chicken were seropositive for *Toxoplasma* antibody by LAT in Sulaimania Province, Iraq [9] and 12 of 50 (24%), samples being positive by Real-Time PCR technique for detection Toxoplasma in Al-Qadissiya province, Iraq [10].

The high seroprevalence rate of infection in present study agreed with the seroprevalence study in Saudia Arabia (32%)[11], and in agreement with others from Egypt reported that, 200 (33.3%) were positive for toxoplasmosis [12] and from Jordan in which *T. gondii* seroprevalence of 36% was detected [13]. Our finding was lower than that of EL Massry et al survey (47.2%) from Giza province in Egypt [14]. These differences in prevalence rate of the disease could be explained by the variation in geographical location, environmental characters, hygienic practices, the number of chicken examined in each study and type of tests used [15, 16].

Current results demonstrated a non-significant relationship between the seroprevalence of *T. gondii* and age, while a significant relationship between the prevalence of *T. gondii* and the different age groups of chicken was detected in many studies, Masood et al. found that The highest seroprevalence (54.14%) was detected in older birds (>1.5 years but < 2 years.) [17]. Mose et al. also showed that the high rate of infection was detected in older chicken (>2 years) [18]. This might be due that the birds with all ages have had the same opportunities for exposure and to get infection.

In current study, no significant difference between urban and rural areas in free ranged chicken infected with toxoplasmosis. This result disagree with study in southern Brazil [19] which found that the lower percentage of *T.gondii* seroposative chickens was found in rural areas than in urban and suburban localities. While

antibodies were detected in chickens obtained from all Local Government Areas in Nigeria with higher titer in rural than urban chickens [20].

Soil contaminated with parasite oocysts shedding by cats is the most important source of infection for intermediate hosts like chickens [7] because their habits of scratching the ground and feeding, facilitated the greater way to the hidden feces of cats [6] The free-range chicken in the study area habitats in backyards of houses in urban areas and around homesteads in rural areas. In most areas of Iraq included the study area, the free-range chickens are slaughtered at home and their viscera such as heads are left for scavengers that can include cats and other animals, and since the study has reported high number of cats around the houses and farms, which is very important, as cats are reservoirs for animal and human toxoplasmosis [4] That could explain the high prevalence observed in the study area whether in urban and rural areas.

Seroposative chickens in the current study were clinically healthy and this agree with many studies [7], since there are only a few reports of clinical toxoplasmosis in chickens worldwide [4].

The main histopathological changes were observed in this study included necrosis, hemorrhage and inflammatory cell infiltration. These observations were consistent to the previous findings by Kittas et al.(1984**)** in some previous mouse model studies [21] and Akhtar et al. (2014) in *T. gondii*-infected chickens [17] Though, there were no histopathological changes observed in another studies in any of the infected chickens and no tissue cysts were found in the inoculated groups [22]

CONCLUSION

The high prevalence of toxoplasmosis in chickens in our study, displays the wide contamination with *T. gondii* oocysts in the living environment of people, and free range chicken might be an important source of infection in human with toxoplasmosis.

Conflict of interest: The Authors declares no conflict of interest related to this work.

Financial Disclosure: have no financial interests related to the material in the manuscript.

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Ethical approval: The Animal Ethics Committee, College of Veterinary Medicine, Tikrit University approved the research protocol. All ethical standards have been applied to experimental animals throughout the experiment period .

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Presence of ABO Antigens of Blood Types in Saliva of Women with Urinary Tract Infection

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ABSTRACT

Absence of the ABO antigen in saliva is a health disadvantage, and could increase susceptibility to a number of diseases such as urinary tract infection.

objective is to explore the influence of secretion of ABO blood group antigens into the body fluids (saliva) in women suffer from UTI.

A total of 241 women aged 18-45 years were included who complained of symptoms indicating UTIs who were attending Obstetrics and Gynecology Department of Al-Yarmouk Teaching Hospital in Baghdad during the period from March 2016 to May 2017. The secretor status of the patients was then determined using the haemagglutination inhibition assay for salivary ABO antigens. ABO antigens secretors were found in 36 women and was higher in women in the age group less than 25 and 25-29 years. Education, occupation and source of water have showed significant effect on infected women with ABO antigens secretor and non-secretor. There are significant differences between both ABO antigens secretors and non-secretor in the presence of pus cells and RBCs, and 13 women infected with *Trichomonas vaginalis* and 11 of them with negative ABO antigens secretors. Positive growth reported in399 specimens. Single Bacterial growths in 149 and 62 with more than one species. The species of bacteria is primarily *Escherichia coli* followed by *Streptococcus, Staphelococcus aureus*, *Pseudomonas, Proteus,* and *Klebseilla*. In conclusion, absence of ABO antigens in saliva increases the susceptibility to UTI with a greater tendency to increased symptoms.

Keywords: *ABO antigens, Saliva, Urinary Tract Infection*

INTRODUCTION

Urinary tract infections are amongst the commonest infections with an extensive fiscal liability to the public, particularly in women, babies and the elderly as around one in two women and one in twenty men will get the infection in their lifetime [1]. The threat of women getting Urinary tract infections in their lives is said to be above 50%, with almost 25 percent experiencing a recurrence [2]. Almost 53%of women aged more than 55 years and about 36% of younger women record a recurrence in a time within one year [3].The most common causative pathogens are Gram-negative rods "*Escherichia coli* which cause about 80% of acute infections. Other Gram-negative creatures comprise *Klebsiella pneumonia* and *Proteus mirabilis*, creatures which inhabit enteric area like Serratia, Pseudomonas, and Enterobacter are rare in the outpatient groups, and nonetheless they are very common in people with intricate Urinary tract infections [4]. A Gram positive coagulase known *Staphylococcus saprophyticus* negative Staphylococcus, results in nearly 10 percent of infections in sexually active young women". Trichomonus vaginalis also can cause UTIs, which is more common in the small group of women [5].

A Secretor can be described as "an individual who secretes their ABO antigens secretors into body fluids like saliva and mucus", while non-secretor on the other hand puts little to none of their ABO antigens secretors into these fluids. Many researchers reported the susceptibility to affect by disease increased among non-ABO antigens secretors giving reasons for these associations to be due to presence of these antigens will add a degree of protection against infectious agents [6] that

will influence pathogenic activity [7]. Non-ABO antigens secretors are at a bigger threat for recurring of Urinary tract infections and are more probable to experience renal scars [8]. Therefore, the present study aimed to determine the relationship between the ABO antigens and susceptibility of women to UTIs.

PATIENTS AND METHODS

This was a cross sectional study included 241 married women aged 18-45 years and live in Baghdad city, complaining of symptoms indicating UTIs who were attended to Obstetrics and Gynecology Department of Al-Yarmouk Teaching Hospital in Baghdad, Iraq during the period from March 2016 to May 2017. Urine specimens were collected using a clean, sterile, plastic bags from each infected woman also 1 ml of non-stimulated saliva was collected from each woman into a sterile glass jar. Questionnaire including socio-demographic and clinical data.

The collected urine samples were centrifuged, then microscopic examination was performed. Each sample was cultured aerobic and facultative anaerobic on different media (Blood agar, Mac Conkey agar, Chocolate agar, Manitol salt agar, Milk agar, Sabouroud Dextrose agar to isolate bacteria and fungi). Regarding isolates diagnosis, it was done according to the well-known established microbiological methods, principally based on morphological characters, Gram-staining method and biochemical reactions.

The salivary presence of ABO antigens was determined using haemagglutination inhibition assay using anti A, B and D sera based on a principle that if ABO antigens present in saliva they will bind with antibodies in the antisera added. The antibodies were n0t available in the mixture (Saliva & Antisera) t0 agglutinate with RBCs suspensins and the subject is a positive ABO antigen secretory and *vice versa* is none or a negative ABO antigens secretory subject [9,10].

Data analysis done using Statistical Packages for Social Sciences- version 24). and appropriate statistical tests were applied according to the variables compared.

FINDINGS

The presence of ABO antigens secretor was found in 36 women and higher levels were reported among women in the age group less than 25 years and 25-29 years (9 and 12 respectively) (Table 1).

Education, occupation and source of water have significant effect on the presence of UTI and there is a significant difference between ABO antigens secretor and non-secretor (Table 2).

The main symptom is suprapubic pain in both ABO antigen secretor and non-secretors, followed by itching and secretions. The more prevalent paired of presence of symptoms is between 7 to 13 days in both ABO antigens secretor and non-secretor (Table 3).

The microscope examination indicated that there are significant differences between both ABO antigens secretor and non-secretor in the presence of pus cells and RBCs. The patients with ABO antigens secretors have no blood cells in urine and only 8 patients have excretion of epithelial cells in urine (Table 4).

Also microscopic examinations indicated that 13 women infected with *Trichomonas vaginalis* and 11 of them (84.6%) were ABO antigens non-secretor

The results of culture in specific media indicated that 399 give positive growth and only 2(0.8%) give no growth. The bacterial growths were present as single bacterial infection is 149, while mixed infections are 62 women that infected with more than one type of bacteria. Fifty-eight women infected with two types of bacteria, while only 4 women infected with three types of bacteria. There are significant differences between ABO antigens secretor and non-secretor (Table 5).

The species of bacteria that present in urine of women included in this study is primarily *Escherichia coli* followed by *Streptococcus, Staphelococcus aureus*, *Pseudomonas, Proteus,* and *Klebseilla* which is the latest one. Also significant differences were observed between ABO antigens secretor and non-secretor (Table 6).

Table 1. Distribution ABO antigens secretor in saliva according to age group.

Age (years)	ABO antigens secretor in saliva		
	Yes (n=36) n (%)	**No (n=205) n (%)**	**Total (n=241) n (%)**
<25	9 (25.0)	28 (13.7)	37 (15.4)
25-29	12 (33.3)	55 (26.8)	67 (27.8)
30-34	4 (11.1)	62 (30.2)	66 (27.4)
35-39	8 (22.2)	44 (21.5)	52 (21.6)
≥ 40	3 (8.3)	16 (7.8)	19 (7.9)
P. value = 0.13			

Table 2. Association between socio-demographic characteristics and presence of ABO antigens secretor of the studied group.

Variable		ABO antigen secretor in saliva			P. value
		Yes(n=36) n(%)	**No (n=205) n(%)**	**Total (n= 241) n(%)**	
Education	Illiterate	1 (2.8)	3 (1.5)	4 (1.7)	0.002*
	Primary	10 (27.8)	120 (58.5)	130 (53.9)	
	Intermediate	12 (33.3)	54 (26.3)	66 (27.4)	
	Secondary	6 (16.7)	18 (8.8)	24 (10.0)	
	College & Higher	7 (19.4)	10 (4.9)	17 (7.1)	
Occupation	Housewife	30 (83.3)	194 (94.6)	224 (92.9)	0.015*
	Employed	6 (16.7)	11 (5.4)	17 (7.1)	
Source of water	Tap water	26 (72.2)	179 (87.3)	205 (85.1)	0.019*
	Filter	10 (27.8)	26 (12.7)	36 (14.9)	
*Significant at P < 0.05					

Table 3. Distribution of main presenting symptoms of the studied group in correlation to the presence of ABO antigens.

Variable		ABO antigens secretor in saliva*			P value
		Yes (n=36) n (%)	No (n=205) n(%)	Total (n= 241) n(%)	
Symptoms	Supra-pubic pain	34 (94.4)	194 (94.6)	228 (94.6)	0.992
	Itching	1(2.8)	6(2.9)	7 (2.9)	
	Secretions	1(2.8)	5(2.4)	6 (2.5)	
Period of infection (days)	< 7	5 (13.9)	24 (11.7)	29 (12.0)	0.924
	7 - 13	30 (83.3)	176 (85.9)	206 (85.5)	
	≥ 14	1 (2.8)	5 (2.4)	6 (2.5)	
	Mean ± SD (range)	7.3±1.6(4-14)	7.6±5.5(4-60)	7.5±5.1(4-60)	
*values are number and (%) unless mentioned. SD: standard deviation,					

Table 4. Results of microscope examination in correlation to the presence of ABO antigens in saliva of women infected with UTIs.

Direct microscope examination		ABO antigens secretor in saliva			P.value
		Yes (n=36) n (%)	No (n=205) n (%)	Total (n=241) n (%)	
Pus cells	Negative	24 (66.7)	38 (18.5)	62 (25.7)	0.0001*
	+	12 (33.3)	107 (52.2)	119 (49.4)	
	++	0 (0.0)	55 (26.8)	55 (22.8)	
	+++	0 (0.0)	5 (2.4)	5 (2.1)	
RBCs	Negative	36 (100.0)	177 (86.3)	213 (88.4)	0.062
	+	0 (0.0)	26 (12.7)	26 (10.8)	
	++	0 (0.0)	2 (1.0)	2 (0.8)	
Epithelial cells	Negative	28 (77.8)	117 (57.1)	145 (60.2)	0.106
	+	6 (16.7)	50 (24.4)	56 (23.2)	
	++	2 (5.6)	36 (17.6)	38 (15.8)	
	+++	0 (0.0)	2 (1.0)	2 (0.8)	
*Significant at P<0.05					

Table 5. Result of cutler in specific media in correlation with presence of ABO antigens in saliva of women infected with UTIs.

Culture finding	ABO antigens secretor in saliva		
	Yes (n=36) n (%)	No (n=205) n (%)	Total (n=241) n (%)
No growth	2 (5.6)	0 (0.0)	2 (0.8)
One type of bacteria	28 (77.8)	149 (72.7)	177 (73.4)
Two type of bacteria	6 (16.7)	52 (25.4)	58(24.1)
Three type of bacteria	0 (0.0)	4 (2.0)	4 (1.7)

Table 6. Species of bacteria that present in correlation with presence of ABO antigens in saliva of women infected with UTIs.

Species of bacteria	ABO antigen secretor in saliva			P value
	Yes (n=36) n (%)	No (n=205) n (%)	Total (n=241) n (%)	
Escherichia coli	19 (52.8)	91 (44.4)	110 (45.6)	0.35
Streptococcus	7 (19.4)	54 (26.3)	61 (25.3)	0.38
Staphylococcus aureus	10 (27.8)	40 (19.5)	50 (20.7)	0.26
Pseudomonas	0 (0.0)	31 (15.1)	31 (12.9)	0.012*
Proteus	2 (5.6)	30 (14.6)	32 (13.3)	0.14
Klebsiella	2 (5.6)	19 (9.3)	21 (8.7)	0.47
*Significant difference.				

DISCUSSION

Urinary tract infection (UTIs) reported in almost 50% of women at some point in their lives [11], and higher morbidity rates associated with these infections. In the genetics of secretor system two options exist; a person can be either ABO antigens secretor or a non-secretor. This was found to be completely independent of person's blood type "A, B, AB, or O" . Several researches have suggested that too many diseases observed in some ABO antigens non-secretor individuals including UTI [12], *Helicobacter pylori* infection [13] and viral infections [14].

The current study revealed a non-significant association between secretor status and symptoms and the period of infection, while there was a significant association between presence of ABO antigens secretor and presence of pus, RBC, and epithelial cells in urine when examined microscopically. Regarding RBCs, all secretors positive had no RBCs in the urine while the sloughed epithelial cells reported in 8 secretors cases. These were also seen in the infected bacteria and *Trichomonas vaginalis*, the heavily bacterial infection with mixed species were present in non-secretor of ABO antigens, these findings agreed other researchers [15, 16], however, enteric bacteria; in particular, *Escherichia coli* remain the mos. frequent case of UTIs. The infection with *Trichomonas vaginalis* was more prevalent in non ABO antigens secretor (84.6%). These may be due to the non-secretary people do not have the enzyme glycosyl-transferase and glyco-compounds giving a way for attachment of the organism with epithelial surface therefore resulting in an infection [15]. It is clear that non-secretor saliva n0t 0nly does not avert the connetion of candida but also stimulates the attachment to the nerves.

The virulence features of candida are as a result of host identification by the cell surface linkage [16]. Other researchers attributted this susceptibility to infections to low levels of IgG and IgA antibodies in non-secretors [17]. Antibodies seem to offer native immunity through destruction of the organism; secretors destroy attacking organisms and stop their access to the host. This description best suites current study that single and little growth seen in secretor women while mixed and heavy growth seen in none secretors. Other researches stated that the secretor status alters the carbohydrates present in the body fluids and this will influence microbial attachment and persistence [18]. The present study agreed other study on UTI that the primarily causes is *Escherichia coli*. Staplet0n et. al, [19] have stated that females with persistent UTI associated to *E. coli* are mainly n0n-secret0rs. The tendency f0r greater adherence 0f the ur0pathogenic *E.coli* was shown by uroepithelial cells of non-secretors when matched with secretors. This appears that absence of secretor substances combines to give an increased risk of recurrent UTI.

In this study, it was found that some demographic characteristics like education, occupation and source of water were associated with absence of ABO antigens and hence increased the susceptibility of UTIs. The same finding was reported by Emiru et. al, [20]; as they mentioned that UTI was high among pregnant women in the presence of associated different risk factors (anemia, low socio-demographic features, past history of UTI and sexual activity).

CONCLUSIONS

The absence of ABO antigens in saliva might increases the susceptibility to UTI in women with a greater tendency to increase symptoms, number and type of causative infectious agent and tend to present worst in low socio-demographic status.

Conflict of Interest : None

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Ethical Clearance: All official ethical agreements were approved Data of participants were collected according to the World Medical Association Declaration of Helsinki 2013, and signed consent was obtained from each participant

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Does the Overweight Trend of Children Aged 0-24 Months in Indonesia Tend to be Increasing and What Factors are Related?: (IFLS Data Analysis Study of 2000, 2007, and 2014)

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ABSTRACT

Background: Overweight is still one of the nutritional problems in Indonesia. It considered as the first signal of the emergence of a group of non communicable disease. Indonesia shows that the problem it on average is still above 5%. **Objective:** This study aims to examine the trend patterns and see whether the factors associated with the occurrence of overweight in children 0-24 months different or not in 2000 and 2014. **Method**: cross sectional approach. Trend data use IFLS 2000, 2007, 2014, see the difference, IFLS 2000 and 2014.Sampling technique by total sampling. **Results :** The trend pattern shows the incidence of overweight in children 0-24 months in 2000 amounted to 7.03%, in 2007 by 8.86% and in 2014 of 7.79%. Chi-Square showed in 2000 factors that have greater chance of overweight of children 0-24 months is birth weight> 3900 gram *(p = 0.033)* and mother's job *(p = 0.0030*). In 2014, the length of birth (*p = 0.032*). Logistic regression showed in 2000 that birth weight> 3900 gram tend to overweight at age 0-24 months of 2.20 times greater than normal (*p = 0.038*). In 2014, birth weight > 3900 gram is 2.07 times greater than normal (*p = 0.047*).The length of birth ≥ 48 cm is 2.05 times greater than below (*p = 0.013*). **Conclusion:** There is a fluctuation in the pattern of overweight in children aged 0-24 months from 2000, 2007 and 2014 which in general there is no improvement. The nutritional status of the child at birth appears to be an important factor associated with overweight in children. The role of maternal nutritional status, before and during pregnancy that may affect fetal growth should also be considered.

Keywords: *Children 0-24 months, Overweight, IFLS survey data, Trends, Indonesia*

INTRODUCTION

To date, Indonesia still faces multiple nutritional problems. Overweight is considered as the first sign of the emergence of non communicable diseases that currently occur in both developed and developing countries.[1]

In fact, overweight in children are multifactorial complex problems.[2]. The period of the first 1000 days of life is early of human life calculated from the first day of pregnancy, the birth of a baby up to the age of 2 years. This period is a crucial period in which the development and growth of a human being go on rapidly, both physically, cognitively, emotionally.[3]

Research evidence suggests that early life also contributes to childhood obesity, so the problem and effects can be prevented early.[4]. The environment from conception to the age of 2 years is the most important factor that must be changed and repaired to prevent obesity and its effects.[5][6]

There are four periods in the first 1000 days of life that contribute to the incidence of overweight: (1) woman's pre-pregnancy period; (2) pregnancy period; (3) exclusive breastfeeding; (4) complementary feeding. [7][8]

Many evidences indicate that prevalence of overweight is rising sharply around the world. South Korea by 20.5%. In Thailand, 16%.[9][10] The National Basic Health Research data, the prevalence of overweight in adolescents aged 15 years and older in Central Java reaches 18.4%, while Surakarta City at 10.7%.[11][12] In Indonesia, the cause of death due to communicable diseases decreased from by 44.2% in 1995 to 28.1% in

2007.[13]

Several factors of the first two years of life that contribute to the incidence of overweight in children aged 0-24 months are maternal diabetes history, birth weight, prelacteal feeding, and exclusive breastfeedin.[7]

Women who have diabetes prior to pregnancy are at risk of having obese children. [2] In exclusive breastfeeding period can prevent certain diseases which are vulnerable to baby, such as asthma, diarrhea, and diabetes in relation to the incidence of overweight. Prelacteal, is very dangerous because the baby's digestive tract is not strong enough to digest food and drink other than breast milk. The birth weight can also be an indicator of overweight risk in children.[14] Study by Anggraini reported that the abnormal birth weight (low/big) has a higher risk of overweight.[15] [16].

STUDY METHOD

This study used secondary data obtained from Indonesia Family Life Survey (IFLS) that was carried out in 2000, 2007, 2014 . The design was cross-sectional approach. This study aimed to find out the trend of overweight and whether there were differences in factors related to the incidence of overweight in 2000 and 2014.

The population of study was all children aged 0-24 months in Indonesia that became the respondents in 2000, 2007, 2014 to get on the trend of overweight. To determine differences in factors related to the incidence of overweight, the respondents in 2000 and 2014. The inclusion criteria were children aged 0-24 months, having complete information on weight, height, birth month, and year of birth. The exclusion criteria were ill children, twin pregnancy/*gemelli* and not having complete data. Data analysis applied included univariate, bivariate, and multivariat.

RESULTS AND DISCUSSION

RESULTS

This study used IFLS data that was conducted in 2000, 2007, 2014. In investigation of survey data, the complete data of all variables was obtained, except data on maternal diabetes history in 2000 which was not obtained as in 2014.

Nutritional Status of Children Aged 0-24 Months in 2000-2014

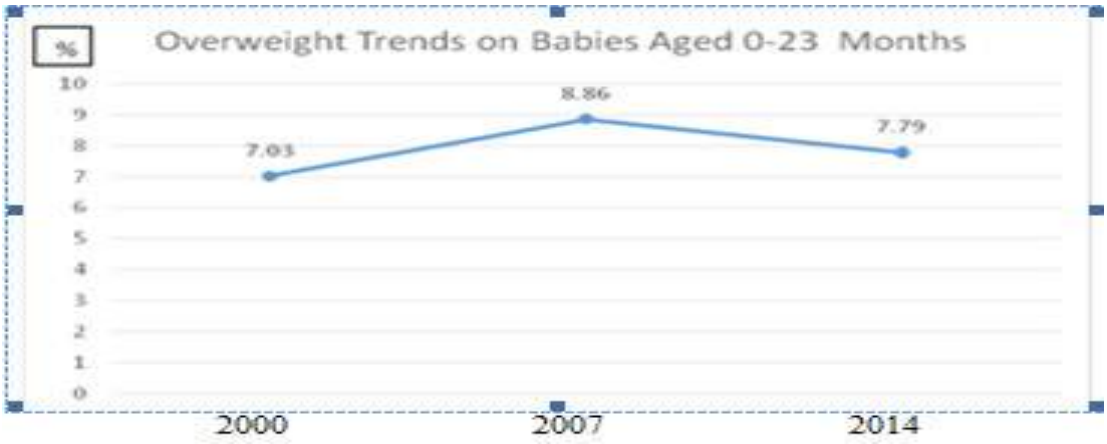

Figure 1. Pattern of Overweight Trend From 2000 – 2014

Figure 1 illustrates that the trend pattern of the overweight incidence tend to be fluctuating. The highest proportion of the overweight incidence occurred in 2007 (8.86%). This fluctuation was seen once in the proportion of overweight in 2000 at 7.03%, then increased to 8.86% in 2007 and back down to 7.79% in 2014.

Comparison of Factors Related to the Incidence of Overweight in Children Aged 0-24 Months in 2000 – 2014

Table 1. Comparison of Characteristics on Infants and Mothers As Well As the Caring Pattern on Overweight Events Based on Each Proportion (%) in 2000 and 2014

Variable	Category	2000				P-value	2014				P -value
		Overweight		No			Overweight		No		
		N	%	N	%		N	%	N	%	
Infants Age	0-6 months (0)	42	10.3	366	90		65	14.4	387	86	
	6-12 months (1)	25	7.4	314	93	0.165	30	7.2	384	93	0.001
	12-23 months	27	5.2	489	95	0.004	30	4.0	713	96	0.000
Birth Weight	<2500 g (0)	4	4.6	83	95		8	7.8	94	92	0.815
	≥ 2500 – 3900 g (1)	74	7	989	93	0.398	101	7.2	1298	93	
	>3900 g (2)	16	14.2	97	86	0.025	16	14.8	92	85	0.114
Birth Length	<48 cm(0)	10	5.8	162	94	0.382	8	3.9	196	96	0.028
	≥48 cm (1)	84	7.7	1007	92		117	8.3	1288	92	
Pre lacteal	No (0)	45	6.6	634	93		312	29.4	749	71	
	Yes (1)	49	8.4	535	92	0.234	213	38.9	335	61	0.197
Exclusive Breastfeeding	no (0)	92	7.5	1129	93		107	7.9	1249	92	
	Yes (1)	2	4.8	40	95	0.501	18	7.1	235	93	0.672
Diabetes History	No (0)	-	-	-	-	-	124	7.7	1477	92	0.616
	Yes (1)	-	-	-	-	-	1	12.5	7.0	88	
Maternal Employment	No (0)	60	6.5	867	94		93	7.5	1145	93	
	Yes (1)	34	10.1	302	90	0.029	32	7.8	339	91	0.483

Chi square p<0.005

Table 1, The proportion of overweight children at the age of 0-6 months in 2014 showed the highest proportion at 14.4% compared to in 2000 (10.3%). Then the birth weight > 3900 gram in 2014 had the highest proportion of overweight (14.8%) compared to in 2000 (14.2%). Evidently, the birth length ≥ 48 cm in 2000 had a smaller proportion (7.7%) than in 2014 (8.3%).

The exclusive breastfeeding, mothers who provided the exclusive breastfeeding had 7.9% in 2014, which was higher than in 2000 at 7.5%. Because there was no information on maternal diabetes history obtained in 2000, then the comparison with 2014 could not be carried out. In 2014, it showed that the proportion of mothers with diabetes history was 12.5%, which was higher than mothers with no diabetes history at only 7.7%. While the higher proportion of maternal employed was also found in 2000 at 10.1%, and it decreased to 7.8% in 2014.

Table 2. Comparison of Relations Factors and Results of Chi-Square causing overweight in Infants aged 0-24 months

2000		2014	
Variable	**p value**	**Variable**	**p value**
Birth weight> 3900 gr	**0.033**	Birth weight > 3900 gr	0.118
Birth length ≥ 48 cm	0.383	**Birth length ≥ 48 cm**	**0.032**
Prelacteal	0.235	Prelacteal	-0.198
Exclusive Breastfeeding	-0.505	Exclusive Breastfeeding	-0.672
Diabetes history	(no obs)	Diabetes history	0.620
Maternal Employment	**0.030**	Maternal Employment	0.483

Table 2 explains that the results of relation of variables in 2000 showed that the birth weight > 3900 gram had a higher probability of overweight if compared with normal birth weight or low birth weight. In 2014, it was only the birth length ≥ 48 cm that had a higher probability of overweight.

The diabetes history in 2000 did not show data observed, so the direction of relation and its significance to the incidence could not be determined and compared with 2014, in 2014 mothers with diabetes history had a higher probability of the overweight incidence than mothers with no diabetes history, but statistically insignificant.

Maternal employment, in 2000 the probability to the incidence of overweight was higher than the unemployed mothers, and there was a significant relation. This condition was different with year 2014.

Table 3. Comparison of Logistic Regression Influential Factors towards Overweight Trends in Infants aged 0-24 months

2000					2014				
No.	**Variable**	**B (p value)**	**μ**	**OR**	**No**	**Variable**	**B (p value)**	**μ**	**OR**
1.	Birth Weight > 3900 gr	**0.068 (0.038)**	**0.089**	**2.204**	1.	Birth Weight > 3900 gr	**0.065 (0.047)**	**0.067**	**2.072**
2.	Birth Length	0.008 (0.710)	0.684	1.113	2	Birth Length	**0.039 (0.013)**	**0.873**	**2.058**
3.	Prelacteal	0.016 (0.258)	0.462	1.286	3	Prelacteal	-0.019 (0.167)	0.340	0.753
4	Exclusive Breastfeeding	-0.017 (0.654)	0.033	0.744	4	Exclusive Breastfeeding	-0.017 (0.296)	0.157	0.765
5.	Maternal Employmen	0.030 (0.104)	0.266	1.492	5	Diabetes history	0.030 (0.765)	0.005	1.459
					6	Maternal Employmen	0.008 (0.615)	0.230	1.120

The results of multivariate in logistic regression showed that in 2000 the significant variable was birth weight > 3900 gram. The statistical results showed that children born > 3900 gram were likely to get overweight at the age of 0-24 months by 2.20 times greater than the children born low birth weight *(p = 0.038*). In 2014, logistic regression showed that the significant variables were birth weight and birth length. It can be concluded that children born > 3900 gram were likely to get overweight at the age of 0-24 months by 2.07 times greater than low birth weight (*p= 0.047*). The children with birth length ≥ 48 cm were likely to get overweight at the age of 0-24 months by 2.05 times greater than birth length < 48 cm (*p= 0.013*).

DISCUSSION

Studies conducted periodically in a long-term period from the period of women's pregnancy to the birth of baby at certain ages are indeed still limited in Indonesia. IFLS has carried it out from 1993 to 2014. There are limited data found in IFLS such as role of maternal nutritional status before and during pregnancy that can affect the fetal growth which should be included, but it cannot be considered anymore because the variable cannot be measured in the survey data.

The Trend Pattern of the Incidence of Overweight in Children Aged 0-24 Months

Figure 1 shows the fluctuating trend pattern of the overweight incidence in children aged 0-24 months in Indonesia. The world's data indicates the childhood obesity in Indonesia at 11.5% and ranks the 21st in the world.[5] Data of the results of nutritional status records that 1.6% children at the age of 0-59 months experience obesity with the highest prevalence in Jakarta and Bali (3.3%), followed by Riau Islands (3.0%) and Papua (2.7%).[18]

Data in this study presented that the highest incidence of overweight in children aged 0-24 months occurred in 2007 at 8.86% (Figure 1). Although there was a decrease in the percentage of the incidence from 2007 to 2014 by 1.07%, but the percentage has been a health problem in Indonesia because the value is more than 5%.

Relation between the Characteristics of Children Aged 0-24 Months and Factors Affecting the Incidence of Overweight

In Table 2, several related factors are shown statistically significant. In 2000, there were two variables significantly related, birth weight > 3900 gram (*p = 0.033*) and maternal employment (*p = 0.030*). In 2014, birth length ≥ 48 cm was the only variable significantly related. Theoretically, the baby's birth weight above normal has a positive relation. The maternal diabetes history was associated with the birth weight and greater fetal adiposity. It is possible that intra-urine condition has changed that is capable of programming fetus to be more susceptible to obesity due to an increasing exposure to nutrition transferred through the placental circulation.[18] Because it can increase the risk of central fat accumulation, insulin resistance, metabolic syndrome, and cardiovascular disease.[16] The results of study stated that maternal employment factor was significantly related (*p = 0.030*) to the incidence of overweight in children aged 0-24 months. The maternal employment has an important role in nutritional problems and related to the family's affordability in food availability.

The birth length shows a significant relation (*p = 0.030*) to the incidence of overweight in children aged 0-24 months. Since a child is born until the age of two years, the child will grow fast. After that period, the growth starts to slow down. By a slow growth, a child needs more calories, then he/she has an erratic dietary pattern. [18]

The Table 3 explains the comparison of most dominant factors affecting the incidence of overweight. Accordingly, the birth weight ≥ 3900 gram in 2000 and 2014 both were the most dominant factor in affecting the incidence of overweight.

CONCLUSION

This study is an analytic observation study with cross-sectional approach. There is a fluctuation in the trend pattern of overweight in children from 2000, 2007, 2014. The chi-square test show that in 2000 factors significantly related are birth weight > 3900 gram (*p = 0.033*) and maternal employment (*p = 0.030*), in 2014 the factor is birth length ≥ 48 cm (*p = 0.03*). The logistic regression explains that the birth weight ≥ 3900 gram in 2000 had a greater probability of the overweight incidence by 2.20 times compared to the birth weight < 3900 gram, and in 2014 the probability was greater by 2.05 times. The birth length ≥ 48 cm had a greater probability of the overweight incidence by 2.05 times

compared to the birth length < 48 cm.

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Physiological Blood Parameters of Young University Adults with Blood Glucose, Blood Pressure and Smokers

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ABSTRACT

This study deals with a new study on the propagation of diabetes, hypertension and smoking among university students. A total of 254 students (77 females and 177 males) were enrolled. Including, 41 healthy and 42 students who were fasting blood glucose; 31 were healthy and 68 were suffering from blood pressure; 39 non smokers and 33 students who were smokers; aged 19-26 years. Statistically significant changes ($p<0.05$) in blood parameters and cases in compression with healthy and non-smoker students. The findings of this study highlight the prevalence of blood glucose and blood pressure in students also smoking and its relation to the number of cigarettes. Educational programs are needful to raise people's awareness around the critical of health impacts of situation and the significance of all of the above criteria.

Keywords: *blood glucose, blood pressure, smoking, blood parameters.*

INTRODUCTION

In 2010, around 285 million people worldwide in the age group of 20-79 are suffering from diabetes, and it is expected to be 438 million in 2030 of the adult population. This global increase in the propagation of diabetes is attributed to population growth, urbanization, aging, increased physical inactivity and obesity[1]. Depending on a national survey conducted in Iraq in 2006, it was evaluated that 10.4% of the adult population had hyperglycemia[2], and it is predicted to increase by the year of 2030 to 2 million[3]. In developed countries, cardiovascular disorder is prevalent with adjustable risk factors is arterial hypertension; where 20%-50% of the adult population is affected[4]. A survey conducted in 1979 found that 12% of the Iraqi population had hypertension[5], and by 2006 it increased to 40.4% [6], and 29.4% in 2008 for both sexes[7]. In a study[8] on cardiovascular risk profile among university students, found that the spread of blood pressure was 5.6% for systolic blood pressure and 8.6% for diastolic blood pressure. In Iraq smoking is a common practice among university students. As in a study[9], tobacco smoking was higher among men under the age of 40 years also study[10] in Iraq, the prevalence of cigarette smoking among medical students was 21%; about 42% of them started smoking at the age of 18-19 years or their first year of medical school. According to[11], the main cause of health cases of infectious diseases in the past century has turned into chronic diseases at present. Chronic diseases such as diabetes, hypertension and cardiovascular diseases are slow progressive non infectious conditions that are considered the major leading causes of death worldwide. Rapid alters in lifestyles and food patterns that occurred after urbanization and industrialization have accelerated in recent years. Later, there was an increase in inappropriate diet pattern, lack of physical activities and use of smoking, and an increase in chronic disease[12]. Blood problems can have a significant influence on patients and should be vigorously pursued and treated[13]. Diabetics often have abnormalities in the blood, these comprise anemia and other erythrocyte problems, white blood cells as well as platelet anomalies are also prevalent among people of diabetes, and diabetes diagnosis can be established by measuring fasting blood glucose[14]. High blood pressure is strongly related to structural and functional disorders of the organs involve in hematopoiesis[15], and blood viscosity is increased in most patient with hypertensive[16]. Smoking is also has an effect on blood parameters. In a study[17] suggested that the smoking of cigarette affect the characteristics of blood as it leads to death. And[18] showed that continuous cigarette smoking had severe adverse impacts on hematological parameters.

MATERIALS AND METHOD

Criteria of participants

A sample of 254 students aged between 19 and 26 years was selected randomly among students of the Faculty of Environmental Sciences at AL-Qasium green University in Iraq. About 83 of blood glucose were divided according to[19]: health (<100 mg/100cm^3), pre-diabetes (100–125 mg/100cm^3), diabetes (≥126 mg/100cm^3), and hypoglycemia (≤70 mg/100cm^3). In addition, 99 of a clinic blood pressure level were divided according to[20]: normotensive (<120/<80), EPB, elevated blood pressure (120-129/<80 mmHg) hypertension (130-139/80-89 or ≥140/90) and hypotension (<90/60 mmHg). And 72 male was only applied for smoking. Women were not comprised because of the tradition of Iraq society, in which restricts the arrival of researchers to females at the time of study, and prevents their smoking. They were divided into: 39 non smokers [control], 9 light Smokers [≤10 cigarette daily], 16 moderate smokers [11–20 cigarette daily], and 8 heavy smokers [≥20 cigarette daily].

Collection of data and measurement

The data were collected using a self-administered questionnaire was developed in Arabic language, and it is built on several axes such as: age, smoking case, the number of smoking cigarettes per day and duration of smoking, the family history of diabetes and physical activities. Pregnant female were eliminated from study to avoid the potential impact of pregnancy on anthropometric and laboratory parameters. The criteria for selecting students were that no one should suffer any medical complication such as heart disease, stroke or any other disorder. A total of 5 ml of the venous blood sample was gathered from the entire study member in the morning after the fasting period for at least 8–10 hours, and blood was transferred to EDTA-tube. Total blood count was measured including: WBC, White blood cells; LYM, lymphocyte; LYM%, Lymphocytes percentage; MON, Monocytes; MON%, Monocytes percentage; GRA, granulocytes; GRA%, granulocyte percentage; RBC, red blood cell; HCT, hematocrit; HGB, hemoglobin; MCV, Mean corpuscular volume; MCHC, Mean corpuscular hemoglobin concentration; MCH, mean concentration hemoglobin; RDW/SD, Red cell distribution width/standard deviation; RDW, Red cell distribution width; MPV, Mean platelet volume; PLT, Platelet count; PCT, Plateletcrit; PDW, platelet distribution width. Using a complete automated blood analyzer (Mythic, France). Blood glucose were measured using the active glucose meter Accu-chek (68305 Mannheim, Germany). Blood pressure was measured by the electronic pressure device, by taking the pressure rate while students were at rest for at least 10-15 minutes.

Statistical analysis

Data of hematological parameters were analyzed using ANOVA, differences of the entire study students for the blood parameters were statistically assessed using F-test. Least significant difference, LSD was applied to compare the results, descriptive analysis was also used to show the mean and standard deviation, SD of the results. P<0.05 was *significant and the various letters indicated significance in p<0.05. The same letters indicate insignificance at p<0.05.

RESULTS

Table 1. A statistically significant (p<0.05) increase in most parameters in diabetic, pre-diabetic and hypoglycemia; also insignificant increase (LYM, RBC, and PDW) and an insignificant reduction (MCH) in hypoglycemia. Other parameters decreased significantly in diabetes, pre-diabetes and hypoglycemia compared to health.

Table 1. Blood parameters of fasting blood glucose classes.

Parameters	Fasting blood glucose classes				LSD
	Health	Pre-diabeteS	Diabetes	Hypoglycemia	
WBC	5.82±0.083a	7.66±0.054b	8.22±0.130b	7.22±0.178b	0.162
LYM	1.90±0.141a	2.10±0.070b	3.04±0.054b	1.98±0.044a	0.116
MON	0.60±0.012a	0.64±0.054a	0.72±0.044b	0.60±0.012a	0.048
GRA	5.54±0.357a	4.54±0.250b	4.42±0.268b	4.54±0.250b	0.370
LYM%	24.88±0.36a	29.7±0.331b	29.2±0.524b	29.8±0.967b	0.790
MON%	7.66±0.230a	8.24±0.207b	9.16±0.114b	8.06±0.054b	0.224
GRA%	65.6±0.544a	63.76±0.70b	61.24±0.09b	61.2±0.738b	0.776
RBC	5.098±0.09a	5.18±0.158b	5.47±0.276b	5.22±0.074a	0.227
HGB	14.42±0.28a	15.36±0.18b	15.58±0.26b	14.5±0.187b	0.308
HCT	46.96±0.33a	50.56±0.05b	50.86±0.16b	48.00±0.62b	0.489
MCV	94.64±0.11a	95.46±0.08b	96.46±0.27b	94.42±0.10b	0.044
MCH	29.12±0.04a	29.54±0.05b	29.74±0.05b	29.00±0.18a	0.134
MCHC	38.76±0.05a	30.48±0.08b	30.52±0.12b	30.44±0.05b	0.116
RDW	12.76±0.16a	12.28±0.13b	12.20±0.07b	12.56±0.11b	0.164
RDW/SD	48.76±0.13a	46.84±0.08b	46.60±0.42b	47.36±0.55b	0.447
PLT	267.2±0.83a	242.8±0.83b	216.4±0.54b	183.6±0.54b	0.948
MPV	8.34±0.050a	8.66±0.050b	8.78±0.040b	8.24±0.040b	0.070
PCT	0.22±0.000a	0.18±0.001b	0.17±0.001b	0.214±0.002b	0.002
PDW	14.04±0.11a	14.28±0.04b	14.56±0.08b	14.16±0.110a	0.127

***Significance when p<0.05.**

Table 2: Most physiological blood parameters have increased in both pre-hypertension and hypertension, and decreased in hypotension when compared with normotensive. A significant decline in MPV from blood glucose classes compared with healthy.

Table 2. Blood parameters of blood pressure classes

Parameters	Blood pressure				LSD
	Normotensive	Elevated blood pressure	Hypertension	Hypotension	
WBC	8.64±0.288a	8.92±0.649a	9.30±0.406b	7.08±0.327b	0.629
LYM	2.02±0.164a	2.44±0.288b	2.48±0.180b	2.00±0.187b	
MON	0.78±0.044a	0.92±0.083a	1.00±0.070b	0.68±0.083b	0.019
GRA	5.30±0.187a	6.02±0.414b	6.10±0.374b	4.46±0.336b	0.454
LYM%	28.48±0.98a	29.7±0.331b	32.02±0.77b	27.7±0.430b	0.910
MON%	9.16±0.304a	9.22±0.268a	11.16±0.09b	7.84±0.167b	0.300
GRA%	62.94±0.76a	65.96±0.08b	68.2±0.148b	61.0±0.738b	1.273
RBC	5.096±0.08a	5.39±0.141b	5.91±0.062b	5.18±0.315a	0.241

Cont... **Table 2. Blood parameters of blood pressure classes**

HGB	13.76±0.15a	14.24±0.21b	17.24±0.15b	16.82±0.13b	0.218
HCT	46.76±0.11a	48.8±0.100b	53.76±0.77b	55.4±0.300b	0.563
MCV	92.62±0.10a	94.88±0.13b	97.46±0.05b	93.80±0.44b	0.319
MCH	28.04±0.13a	29.58±0.38b	29.56±0.13b	28.04±0.13b	0.292
MCHC	30.30±0.07a	30.84±0.05b	30.86±0.05b	30.44±0.05b	0.079
RDW	12.7±0.120a	12.86±0.15a	12.9±0.070b	13.28±0.14b	0.170
RDW/SD	47.36±0.11a	49.06±0.47b	49.34±0.53b	47.54±0.11b	0.488
PLT	194.2±2.28a	240.2±1.48b	241.8±0.83b	197.6±2.30b	2.454
MPV	9.08±0.080a	8.34±0.150b	8.08±0.100b	8.36±0.150b	0.170
PCT	0.169±0.05a	0.22±0.003a	0.24±0.001b	0.22±0.002a	0.059
PDW	14.1±0.070a	15.10±0.12b	15.38±0.08b	14.66±0.02b	0.177

The *significance when p<0.05.

Table 3: Shows a significant increase at p<0.05 in WBC, MON%, RBC, HCT, HGB, MCV, MCHC, MCH, PLT, RDW/SD, RDW, MPV and PDW, whilst a statistically decrease in PCT at of smokers compared with control. The rest of parameters were not-significant at p<0.05 in smokers compared with control.

Table 3: Blood parameters of smoking status.

Parameters	**Smoking status**				**LSD**
	Non-smoker	**light smokers**	**moderate smokers**	**heavy smokers**	
WBC	6.96±0.790a	7.96±0.610b	7.98±0.630b	9.10±0.330b	**0.825**
LYM	1.98±0.506a	2.04±0.296a	2.12±0.238a	2.40±0.367a	
MON	0.78±0.013a	0.50±0.070a	0.52±0.109a	0.56±0.114a	
GRA	4.06±0.743a	5.14±0.150a	5.36±0.645a	5.74±0.103a	
LYM%	27.4±0.323a	27.96±0.79a	29.76±0.65a	31.5±0.2.65a	
MON%	5.98±0.798a	6.38±0.476a	6.68±0.356a	7.16±0.384b	**0.715**
GRA%	62.3±0.705a	64.41±0.58a	65.56±0.49a	66.2±0.234a	
RBC	4.85±0.354a	5.00±0.380a	5.55±0.139b	5.71±0.181b	**0.380**
HGB	13.8±0.273a	14.44±0.35b	15.5±0.583b	16.3±0.254b	**0.245**
HCT	43.83±1.07a	48.56±1.65b	50.90±0.62b	55.72±0.74b	**1.493**
MCV	92.22±0.27a	95.88±0.54b	97.48±0.84b	98.52±0.37b	0.793
MCH	27.90±0.39a	29.51±0.10b	29.18±0.08b	30.16±0.56b	0.470
MCHC	30.28±0.16a	30.32±0.38a	31.78±0.08b	30.86±0.13b	0.302
RDW	46.34±0.41a	46.78±0.48a	52.30±0.29b	53.28±0.17b	0.484
RDW/SD	49.22±0.19a	49.58±0.26a	55.52±0.08b	57.42±0.28b	0.298
PLT	296.4±1.14a	253.2±1.92b	222.6±0.54b	207.2±1.30b	1.773
MPV	7.86±0.050a	8.42±0.040b	8.66±0.05b	8.74±0.080b	0.379
PCT	0.21±0.000a	0.20±0.000b	0.15±0.001b	0.214±0.002b	0.001
PDW	14.42±0.04a	15.10±0.07b	15.36±0.05b	16.18±0.080b	0.087

Table-1: Smoking status of students according to blood parameters.

The *significance at p<0.05.

DISCUSSION

Many hematological alters affecting WBCs and RBCs appeared to be directly connected with diabetes[21], and other blood abnormalities noted in blood glucose patients include platelet abnormalities[22]. In[23] showed that the number of leukocytes is high, while there is no change in the number of monocytes in blood glucose patients, these results are consistent with some current outcomes. While[24] study appeared an insignificant increase in RBC in diabetic patients. Significant increases in MCV and HCT may be due to several morphological alters demonstrated by WBCs and structural changes in plasma connected with diabetes T_2[25]. The RDW values were low between blood glucose and health students, and this result was consistent with[26]. The cause of increase in PDW and MPV may be associated with blood vessel complications in diabetics[27]. A significant increase in WBC of blood pressure classes came favorable[28]. High glucose and high blood pressure are noted to trigger activation of kinase C protein, which can perform a role in rising the leukocytes oxidative stress caused by high blood pressure and diabetes[29]. And[30] noted that RDW as increased significantly in patients with pre-hypertension and hypertension groups. While[31] found that MPV, PDW and PLT are those indicators that can assist diagnose high blood pressure. HCT is positively connected with hyper-insulinemia and hazard factors linked with resistance of insulin, such as high blood pressure[32]. Smoking of cigarette has severe adverse effects on most hematological parameters, the significant increase in these parameters in smoker are correlated with previous studies[33,34]. Actually, the constituents of cigarette induces increase in a count of leucocytes. The main one is nicotine, the role of nicotine is to stimulate the secretion of hormones that lead to elevate total leucocytes count[35]. Smoking cigarettes generates a unique state of polycythemia combined into chronic hypoxia, leading to increased production of RBC due to elevated carboxy hemoglobin level [36]. The current study established significantly larger values of MCV, MCH, MCHC, RDW and RDW/SD among smokers and by[37]. The smaller values of PCT in smokers agreed with[38].

CONCLUSION

The measurement of physiological blood parameters is necessary, because these changes in parameters can be linked with increased risk of many diseases. Monitoring blood glucose, blood pressure and young smoking is worth doing because a high proportion of students were either blood glucose and blood pressure or smoker.

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NIHL that Affected by High Frequency Noise on Workers at Production Area in Water Supply Company PT. X

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ABSTRACT

Noise level in Water Treatment Plant (WTP) is high enough. Increasing the need for clean water in line with the increasing population, making the Water Supply Company (PDAM) is required to increase production capacity. There are machines and production processes that have different characteristics than other types of industries. There are 306 PDAMs throughout Indonesia, the potential number of workers exposed to noise is very large, it is necessary to further investigate the relationship between noise characteristics and its determinants to hearing loss to PDAM workers to obtain the most appropriate form of control. This study used a cross sectional study design. The stages of this study are to measure the noise level and provide questionnaires as primary data, analyzing the worker audiometric results as secondary data and using Chi Square statistical test and multi determinant analysis to find out the relationship between independent and dependent variables. The results obtained that the source of noise in water treatment plants are pumps, exhaust fan, compressor, blower, vacuum and waterfall. The findings show that there are around 84.4% of workers in the production area exposed to noise > 85 dBA and 15.6% of workers have hearing loss. It is concluded that exposure workers over 85 dBA with dominant noise frequency > 2000 Hz can cause hearing impairment and aggravate if workers are > 40 years old and have a working life > 14 years.

Keywords: *Noise; Water Supply Company; Hearing Loss; Noise frequency.*

INTRODUCTION

The need for clean water is increasing every year with the increasing population in the world(1). The United Nations estimates that the world's population will increase to 9.3 billion by 2050. Previous study examined that the quality of groundwater and river water in DKI Jakarta Province in 2030 will be worse than the quality of groundwater and river water in the year 2000. More water supply is needed from water treatment plants in order to meet the need for clean water in the future(2).

The noise level at the water treatment plant is quite high. In Latvia, there was a level of noise exposure around the blowers found at the local water treatment plant of 100 dB which exposed workers(3). Whereas in Indonesia, based on previous research the level of noise exposure in the production area of the Regional Drinking Water Company (PDAM) Tirtanadi Medan has exceeded the national quality standard KEP-48 / MENLH / 11/1996.

PT X is a regional water supply company that is responsible for the operation of clean water supply for residents of DKI Jakarta. Each PDAM uses production equipment to support the processing of dirty water into clean water. Overall there are 306 PDAMs throughout Indonesia. The use of production equipment such as pumps, air compressors, blowers and large capacity Variable Speed Drives (VSD) is a source of noise hazards for workers. The use of production tools that produce noise has the potential to reduce hearing function for workers (data on May, 2000).

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Noise hazards in PDAMs also have specific characteristics compared to other industrial fields. In its operational activities, fluctuations in the flow of water in the pipe due to valve closure, water hammer and turbulence flow also cause noise hazards(7). Other previous research, piping systems that drain water will create vibrations and noise resulting from the movement of water, air, piping system components and pipe support structures. In order for the clean water produced at the water treatment plant to be distributed evenly to all consumers, a booster pump is needed to increase the pressure and supply of clean water. In the operation of the booster pump, frequent water supply fluctuations in the booster pump occur(4). If the water supply to the booster pump decreases, it will cause cavitation at the pump. If cavitation occurs at the pump, it will increase the noise and vibration generated by the pump(5). These things certainly become a noisy danger for workers who work in the vicinity. Clean water service that is relentless 24 hours a day and 7 days a week requires workers to work in a 3 shifts rotation system, this increases the dose of noise exposure received by workers.

NIOSH (National Institute for Occupational Safety and Health) estimates the number of workers who have the potential to experience hearing impairment due to work activities ranging from 30 million workers(6). While the prevalence of employees with noise-induced hearing loss or Noise-Induced Hearing Loss (NIHL) in PT X is quite high, which is 8.7% for the right ear and 10.6% for the left ear with a source of workplace exposure of 95 dBA. As many as 23.8% of NIHL sufferers among PT X employees work in the production area.

The aim of this study is to know the relationship between noise frequency, noise level and worker characteristics (age, years of service, use of ear protectors, smoking habits, history of Diabetes Mellitus, history of hypertension, noise-related habits, use of ototoxic drugs and vibration exposure) to impaired function hearing on workers in the production area of PT X.

MATERIALS AND METHOD

The study design was an analytical study with cross sectional. This research is to see the description of noise source characteristics in the PDAM and to see the relationship of noise exposure with hearing impairment by analyzing other factors that can influence it, including age, noise frequency, years of service, use of personal protective equipment (ear protectors), disease, smoking habits, hobbies related to noise, chemical exposure and vibration. This research was conducted in the PT X production area located in DKI Jakarta. The PT X production area consists of two water treatment plants, namely at Water Treatment Plant 1, Water Treatment Plant 2 and booster pump. The number of population used in this study were 64 workers. The sample taken was that the entire working population had met the inclusion criteria and did not include exclusion criteria. The study samples were all workers who work in the PT X production area when the research was conducted. Primary data was obtained from filling out the self administrative questionnaire and the results of Leq_{8hours} calculation of the noise exposure dose for workers exposed to noise in the PT X production area, as well as the measurement of the dominant noise frequency. Secondary data was obtained from PT X partner clinics that were trusted to conduct Medical Check-Up for PT X workers.

FINDINGS AND DISCUSSIONS

The source of noise in the PT X Water Supply Company is from the distribution pump, booster pump, exhaust / fan, blower, compressor, accelerator motor, waterfall, and vacuum. A total of 11 measurement points (26.2%) from a total of 42 measurement points in the PT X production area had a noise pressure above 85 dBA. A total of 3 measurement points (7.1%) of a total of 42 measurement points in the PT X production area have a dominant noise source above 2000 Hz. A total of 2 points (4.7%) from a total of 42 intermittent noise types.

According to Table 1, based on the results of audiometric examinations on the right and left ears, a number of 54 (84.4%) participants had normal hearing function status. While as many as 10 participants (15.6%) experienced a mild interference in their hearing function. In further investigated, there were 2 participants who experienced mild disruption only in their right ear, and there were 3 participants who experienced mild interference only in their left ear. While participants who experienced mild disruption in both ears were 5 participants.

Table 1. Prevalence of Hearing Loss at PT X

Prevalence of Hearing Loss	f	%
Mild Interference	10	15,6%
Normal	54	84,4%
Total	64	100,0%

Table 2. Result of Research

Variable		**f**	**%**	**P-Value**	**Odd Ratio**	**CI**
Noise Exposure	> 85 dBA	54	84,4%	0,594	-	95%
	≤ 85 dBA	10	15,6%			
Dominant Noise Frequency	> 2000 Hz	20	31,3%	0,004	7,4	95%
	≤ 2000 Hz	44	68,8%			
Age	> 40 years old	39	60,9%	0,04	7,2	95%
	≤ 40 years old	25	39,1%			
Years of Service	> 14 years old	39	60,9%	0,04	7,2	95%
	≤ 14 years old	25	39,1%			
Smoking Habit	Smoking	43	67,2%	0,208	-	95%
	Not Smoking	21	32,8%			
History of DM	Yes	0	0,0%	-	-	95%
	No	64	100,0%			
History of Hypertension	Yes	6	9,4%	0,21	-	95%
	No	58	90,6%			
Noise Related Hobbies	Have	4	6,3%	0,594	-	95%
	Have not	60	93,8%			
Chemical Exposure	Yes	0	0,0%	-	-	95%
	No	64	100,0%			
Vibration Exposure	Yes	49	76,6%	0,78	-	95%
	No	15	23,4%			

According to Table 2, the results of Leq_{8hours} noise exposure dose measurements showed that 54 participants (84.4%) were exposed to noise above the TLV. Characteristics of workers in the production area of PT X are 39 people (60.9%) over the age of 40 years, 39 people (60.9%) have a service life of over 14 years, 43 people (67.2%) are smokers, 64 people (100%) had no history of Diabetes Mellitus, was not exposed to chemicals and did not use ototoxic drugs, 49 people (76.6%) were exposed to vibrations, and 4 people (6.3%) had noisy habits. The results of the audiometric examination at the last Medical Check-Up were obtained as many as 10 participants (15.6%) experienced hearing impairment. A total of 8 participants (80%) who experienced hearing impairment worked at the location of the science production sub-area 1. Judging at a frequency of 4000 Hz, as many as 51 participants (73.9%) had normal hearing function, 7 (10.1%) experienced mild interference, 9 (13%) experienced moderate disturbances, 1 (1.4%) experienced moderate severe disorders and 1 participant (1.4%) experienced severe hearing loss at a frequency of 4000 Hz. The dominant factors of age, working period and noise frequency have a statistically significant effect on hearing impairment in workers in the PT X production area. The noise exposure factor also affects the occurrence of hearing loss but has not reached a

statistically significant limit. The results of the multi determinant analysis show the frequency of noise gives the most powerful influence on hearing impairment. It can be concluded that workers exposed to noise above 85 dBA that have a dominant noise frequency> 2000 Hz can cause hearing impairment and are exacerbated if workers are> 40 years old and have a service life of> 14 years

Based on the findings of this research, it is suggested that the company need to control the risk of hearing loss in workers at the production area of PT X in accordance with the control hierarchy. [Substitution] To replace the compressor at IPA 1 with the type of compressor that does not produce noise pressure above 85 dBA, which is a silent air compressor with a noise pressure below 60 dBA. [Engineering Control] Adds a cover to the compressor at IPA 1 to reduce the dose of noise exposure received by workers in the production area of PT X. Perform periodic maintenance specifically and routinely on production equipment that results in noise pressure above the NAV and dominant noise frequency above 2000 Hz. [Administration] PT X needs to implement the Hearing Conservation Program (PKP) expressly accompanied by policies from the management and overall to increase top management's commitment to controlling noise hazards in the workplace. Rotations of workplaces should be held for workers over the age of 40 years and / or workers with a work period of more than 14 years so as not to work in areas with noisy exposure above the TLV. Training should be held on physical hazards in the workplace, especially noise and vibration hazards to increase workers' awareness of the importance of complying with all regulations and policies related to physical hazards in the workplace. It is necessary to stop smoking campaigns to reduce the risk of hearing loss in workers due to smoking habits, because most of the participants in this study were smokers. Workers in the PT X production area often exchange shift schedules due to personal interests. Workers in the PT X production area must comply with the standard shift schedule which is 8 hours per day to reduce the dose of noise exposure received and provide resting time on the ear organs. PT X needs to do noise mapping to make it easier to plan for controlling the risk of noise hazards in the production area of PT X. [Personal Protective Equipment] PT X is obliged to provide ear protection equipment of high quality and quantity to meet the needs, and put it in a place that is easily accessible by workers.

CONCLUSION

The high frequency noise > 4000 Hz can cause hearing impairment and the damage can be worsened if the workers are more than 40 years old and already worked at the company for more than 14 years.

Conflict of Interest : None.

Ethical Clearance : Was obtained from the Ethics Committee Faculty of Public Health Universitas Indonesia No. 621/UN2.F10/PPM.00.02/2018

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Analysis of Factors Related to Behavior Cognition and Effects on Pregnant Women in Maternal and Child Health (Mch) Handbook Utilisation

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ABSTRACT

Background: Mothers' and childrens' mortality remains a problem, especially in developing countries. Various policies have been introduced by the government to reduce maternal and infant mortality, one of which is the use of Maternal and Child Health Handbooks (MCH) for pregnant women and mothers with toddlers. This study wants to explore factors related to perceived benefits, perceived bridges, and self-efficacy of pregnant women using MCH Handbooks. **Method:** This study was a cross-sectional study conducted on pregnant women and mothers with toddlers in health centres in Surabaya. The number of respondents in this study were 114 selected by simple random sampling. **Results:** There is a significant relationship between age (p = 0.010) and pregnancy history (p = 0.000) with obstacles perceived by respondent in the use of MCH Handbooks. There is a significant relationship between education levels (p = 0.040), pregnancy history (p = 0.001) and number of children (p = 0.002) with self efficacy in the use of MCH Handbooks. There is a significant relationship between income (p = 0.004) and perceived benefits in the use of MCH Handbooks. **Conclusion**: The factors that are related to the obstacles perceived by mothers in the use of MCH Handbooks are age and pregnancy history. The level of education, the history of pregnancy and the number of children related to the mother's self-efficacy in using the MCH Handbook and income are related to the benefits perceived in using the MCH Handbook.

Keyword: *factors, perceived barrier, perceived benefit, self-efficacy, Maternal and Child Health Handbook*

INTRODUCTION

Some the programs for the Sustainable Development Goal (SDGs) are to reduce maternal mortality rates to below 70 per 100,000 live births, ending preventable infant and under-five deaths.[1] The World Health Organization data show that around 830 mothers die every day due to complications of pregnancy and childbirth.[2] Indonesia's maternal mortality is still a problem despite a decline in the incidence of maternal mortality[3] from 32,007 in 2016 to 10,294 in 2017. East Java is the province in Indonesia which accounts for 75% of maternal and child mortality rates in Indonesia.[1]

The government has implemented policies to reduce maternal and child mortality by increasing access to quality health services for everyone at every stage of life by approaching a continuum of care through comprehensive interventions (promotive, preventive, curative and rehabilitative) in full. One of the real activities is campaign and community empowerment, namely the application of the Maternal and Child Health (MCH) Handbook. Some research results show that the use of MCH Handbooks can increase antenatal care visits and improve communication between mothers and health care providers [4,5].

The Maternal and Child Health Handbook is a tool to detect early disturbances or problems with maternal and child health, to encourage communication and offer counseling tools with information that is important for mothers, families, and communities regarding services, maternal and child health, including references and MCH service standards, nutrition, immunisation, and child development. The MCH Handbook is one of the tools for disseminating information about maternal

and child health services for pregnant women, on childbirth and during the puerperium period until the baby is 5 years old. The MCH Handbook contains a history of pregnancy, birth, child growth and development, a history of immunisation and a child growth chart.[6]”mendeley” : { “formattedCitation” : “⁶”, “plainTextFormattedCitation” : “6”, “previouslyFormattedCitation” : “⁶” }, “properties” : { “noteIndex” : 3 }, “schema” : “https://github.com/citation-style-language/schema/raw/master/csl-citation.json” }

The MCH Handbook is an effort to indirectly reduce maternal mortality in Indonesia. However, the use of MCH Handbooks is still not optimal. All pregnant women visiting the health centre have MCH Handbooks. Puskesmas officials stated that even though pregnant women had MCH Handbooks, they were rarely read or studied by mothers and families for various reasons including not having time, not understanding, and assuming that the MCH Handbook was a notebook for health workers; they even found MCH Handbooks were often damaged.

Less than optimal maternal behaviour in the utilisation of MCH Handbooks can be influenced by several factors including knowledge, attitude, and awareness of mothers about the importance of the MCH Handbook so that mothers are less committed to using the MCH Handbook properly. Previous research shows that there is a relationship between the function of recording in MCH Handbooks and MCH knowledge; there is no relationship between the functions of education and communication in the MCH Handbooks and MCH knowledge[7] and the role of cadres as supervisors.[8] Factors related to the lack of mother’s willingness to use the MCH Handbook need to be studied, especially the perceived barriers and the mother’s self-efficacy in using the MCH Handbook.

METHOD

Desain

This study is a cross-sectional study.

Instrument

The instrument includes prior related behaviour and socio-cultural biological psychological personal factors. Questionnaires about characteristics were developed by researchers by adopting and developing questionnaires.[9] Data on the characteristics of respondents include age, ethnicity, educational level, occupation, income, number of children, history of pregnancy, insurance ownership, history of ownership of the MCH Handbook.

Behaviour-Specific Cognitions and Effect

This instrument measures perceived benefits of action, barriers to action and self efficacy in the act. This instrument was developed by researchers by adopting ideas from the previous research questionnaire.[9] It was further developed and modified by researchers in accordance with the use of MCH Handbooks.

RESPONDENTS

The sample in this study was pregnant women and mothers who had children under five in two health centres in Surabaya with the inclusion criteria: 1) Willing to become a respondent, 2) Having an MCH Handbook; 3) Can read and write. The sample size for this study was 114 respondents.

Data Collection

Researchers asked for data on pregnant women and mothers with toddlers in the health centre where the study was conducted. The researcher chose random sampling of respondents who then came to the respondent’s house based on data from the health care service. The researcher gave a description of the study and asked the respondent to sign an informed consent form if they were willing to become research respondents. Then, the researcher asked the respondents to fill in demographic data and fill out the research questionnaire.

Ethical Clearance

This study has received ethical approval from the health research ethics committee of the health ministry of Surabaya health ministry, number 206 / S / KEPK / VI / 2018.

RESULTS

Most respondents were aged from 17-25 years, a total of 48 respondents (42.1 %). The educational level of the majority of respondents was primary level, totalling 60 respondents (52.6 %). The income level of most respondents was the same because of the regional minimum wage level in Surabaya; 84 people (73.7%) had similar income levels. The pregnancy history of the

majority of respondents, namely primipara as much as 85% (74.6%) and most have a number of children, one of which is 57 respondents (50 %).

Table 1 Demographic data of respondents

Data	N	%
Age		
Late teenager	48	42.1
Early adult	41	36
Late adult	23	20.2
Early elderly	2	1.8
Education		
Elementary school	60	52.6
Middle school	39	34.2
High school	15	13.2
Income		
<regional minimum wage	6	5.3
= regional minimum wage	84	73.7
> regional minimum wage	24	21.1
Pregnancy history		
Primipara	85	74.6
multipara	29	25.4
Number of children		
1	57	50
2-3	38	33.3
>3	19	16.7

Table 2 Frequency of cognition and effect behaviour

Variable	N	%
Perceived benefit		
Very helpful	39	34.2
Helpful	29	25.4
Less useful	39	34.2
Useless	7	6.1
Perceived barriers		
Not blocking	78	68.4
Inhibiting	36	31.6
Self-efficacy		
Very confident	62	54.4
Sure enough	41	36
Not sure	11	9.6

The results showed that 34.2% of the respondents stated that the use of MCH Handbooks was very useful. A total of 78 respondents (68.4%) stated that they were not hampered by using MCH Handbooks and 62 respondents (54.4%) had good self-efficacy (Table 2).

Table 3: Relationship of demographic factors with behavioural cognition and effects

Variable	Behavior cognition and effects											
	Benefits				Barriers				Self efficacy			
	Mean	p	CI		Mean	p	CI		Mean	p	CI	
Age		.216				.010				.513		
Late teenager	2.381		2.186	2.577	1.495		1.385	1.605	1.789		1.530	2.048
Early adult	2.385		2.197	2.574	1.444		1.338	1.550	1.687		1.437	1.937
Late adult	2.552		2.332	2.773	1.580		1.456	1.704	1.918		1.626	2.211
Early elderly	2.836		2.229	3.443	1.957		1.615	2.299	1.643		.838	2.448
Education		.991				.784				.040		
Elementary school	2.546		2.332	2.761	1.642		1.521	1.762	1.555		1.271	1.840
Middle school	2.540		2.306	2.774	1.605		1.473	1.737	1.782		1.472	2.093

Cont... **Table 3: Relationship of demographic factors with behavioural cognition and effects**

Variable	Behavior cognition and effects											
	Benefits				Barriers				Self efficacy			
	Mean	p	CI		Mean	p	CI		Mean	p	CI	
High school	2.530		2.233	2.826	1.611		1.444	1.778	1.940		1.547	2.334
Income		.004				.281				.737		
< regional minimum wage	2.947		2.564	3.330	1.610		1.395	1.826	1.690		1.182	2.198
= regional minimum wage	2.355		2.178	2.533	1.669		1.569	1.769	1.833		1.598	2.068
> regional minimum wage	2.314		2.078	2.551	1.578		1.445	1.712	1.755		1.441	2.069
Pregnancy history		.528				.000				.001		
Primipara	2.570		2.358	2.782	1.146		1.027	1.266	1.531		1.250	1.813
multipara	2.507		2.261	2.753	2.092		1.954	2.231	1.987		1.661	2.314
Number of children		.181				.762				.002		
1	2.608		2.367	2.848	1.645		1.509	1.780	1.443		1.123	1.762
2-3	2.614		2.371	2.858	1.619		1.482	1.756	1.845		1.522	2.168
>3	2.395		2.125	2.664	1.594		1.442	1.745	1.990		1.633	2.348

The results showed that there is a significant relationship between age and perceived barriers in the use of MCH Handbooks (p = 0.010) and there is no significant relationship between age and perceived benefits (p = 0.216) and self-efficacy (0.513) in the use of the MCH Handbook. There is a significant relationship between the level of education with self-efficacy (p = 0.040) in the use of MCH Handbooks, but there is no significant relationship between the level of education with perceived benefits (p = 0.991) and perceived barriers (p = 0.784) in the use of MCH Handbooks. The results show a significant relationship between income and perceived benefits (p = 0.004) in the use of MCH Handbooks but there is no significant relationship between income and perceived barriers (p = 0.281) and self-efficacy (p = 0.737) in the use of MCH Handbooks. The history of pregnancy has a significant relationship with perceived barriers (p = 0.000) and self-efficacy (p = 0.001) in the use of MCH books but does not have a significant relationship with perceived benefits (p = 0.528) in the use of MCH Handbooks. The number of children has a significant relationship with self-efficacy (p = 0.002) in the use of MCH Handbooks but does not have a significant relationship with benefits (p = 0.181) and perceived barriers (p = 0.762) in the use of MCH Handbooks.

DISCUSSION

Age has a significant relationship with perceived obstacles in the use of MCH Handbooks. Most respondents are in their late teens to early adulthood. Most respondents stated that they were not hampered by using KIA Handbooks.

The results of previous studies stated that mothers of productive age were more interested in utilising the

MCH Handbooks and always carried KIA Handbooks as a medium to communicate with health workers.[10] Other studies state that the older the mother's age, the more interested they are in using antenatal care services.[11] Age affects a person's mindset and capture power. As you get older, you will develop a catching power and mindset. Greater maturity in the age of a pregnant woman can influence how much information she receives. However, other studies show that the use of MCH Handbooks is most common among mothers of a young age at the age of <20 years due to the fact that at this age, the mother usually experiences her first pregnancy and pays more attention to the condition of her pregnancy.

The mother's education level has a significant relationship with self-efficacy in the use of MCH Handbooks. Some respondents in this study have primary school level education. Most respondents have a high level of self-efficacy.

Previous research shows that the level of education is related to the use of antenatal care.[12] A high level of education and a good level of knowledge will facilitate the mother in receiving information and analysing it.[13] Bandura in Masraroh states that one of the processes of self-efficacy is cognitive, which is related to the level of one's knowledge. A good level of knowledge and a high level of education will contribute to a person's high self-efficacy. However, not only is a high level of education related to high self-efficacy, there are several other factors that affect a person's self-efficacy, namely income level and previous experience.

Income has a significant relationship with perceived benefits and self-efficacy in the use of MCH Handbooks. Most respondents have income equal to the amount of the regional minimum wage (regional minimum wages).

Income is related to the welfare of mothers and families. Previous research shows that mothers from wealthy families will be more exposed to information from various media such as TV, internet and newspapers and that will increase their knowledge regarding antenatal care services.[14] In addition, income is related to perceived barriers in obtaining health priorities at a higher order than basic needs,[15,16] so that individuals who have less income can neglect the use of MCH Handbooks at the health centre.

Pregnancy history has a significant relationship with perceived barriers and self-efficacy in the use of MCH Handbooks. Most respondents have a history of primiparous pregnancy. Previous research also states that most primiparous mothers use KIA Handbooks well compared to multiparous mothers.[17] This may be because the mother who is experiencing a first pregnancy will focus more on the care obtained so that MCH Handbooks will be used more often by primiparous mothers.

Primigravida mothers will always want good pregnancies because they have no previous pregnancy experience. So, primiparous mothers tend to want to always take care of their pregnancy so they can deliver safely and comfortably. The results of previous studies showed that primiparous mothers tended to check their pregnancies more frequently than multiparous mothers.[18] Other studies state that experience is a determining factor in increasing a person's self-efficacy (Bandura, 1986). In multiparous mothers, pregnancy experiences make mothers feel that they have experience in dealing with pregnancy so that mothers are less motivated to use the MCH Handbook.

The number of children has a significant relationship with self- efficacy in mothers in terms of the use of MCH Handbooks. Most respondents had one child and had very high self-efficacy.

In mothers with one child, they have had experience of using MCH Handbooks so they have high self-efficacy.

CONCLUSIONS

The factors related to the obstacles felt by mothers in the use of MCH Handbooks are age and history of pregnancy. The level of education, the history of pregnancy and the number of children related to the mother's self-efficacy in using the MCH Handbook and income are related to the benefits felt fromusing the MCH Handbook.

The MCH Handbook can encourage mothers by offering various information related to family health issues and prevention of illness in pregnant women, thus improving maternal and child health. Therefore, the use of MCH Handbooks is very important to ensure mothers and children receive ongoing care.

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Road Accident Investigation in Indonesia: An Analysis from Human Aspect Perspective

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ABSTRACT

National Transportation Safety Committee (NTSC) Indonesia mentioned that human aspect precipitated 72.73% of the total road accidents that occurred from 2007 – 2011 . This study analyzed the road accident phenomena in Indonesia in 2011 – 2013 (21 cases) from human factors perspective in road accident. The goal is to uncover human factors issue in road accident investigation. Unit analysis is posed from road accident investigation report which has been investigated by National Transportation Safety Committee (NTSC) Indonesia in 2011 – 2013. The result of this study consists of two parts. First, data recording stands to be main issue in the investigation of road accident. Incomplete data record leads to misleading analysis of road accident investigation. Second, from unsafe acts factor: user road type and vehicle ownership are weak defense factors that contribute to road accident, while license type, driving experience, and fatigue are uncomprehensive data in unsafe acts factor occurred. Time, crash type, vehicle type, weather condition, light condition, and road condition are weak defense factors that contribute to road accident in precursors of unsafe acts factor. This result shows that precursors of unsafe acts factor in road accident in Indonesia has more weakness than unsafe acts as a barrier in road transportation to prevent more accident in road transportation.

Keywords: *Human Factors, Road Accident, Investigation.*

INTRODUCTION

The National Transportation Safety Committee (NTSC) Indonesia mentioned that 72.73% of road accidents in 2007-2011 were caused by human aspect [(1)]. The percentage was far exceeding other factors such as vehicle factor (15.15%), infrastructure factor (3.03%), and any other factors that cannot be described and investigated later by National Police of Indonesia (9.09%).

NTSC Indonesia has released 21 investigation reports of road accidents during 2011 – 2013. There are 13 reports that mentioned human aspect as the main factor behind road accidents in Indonesia. Meanwhile, the other reports mentioned vehicle factor, infrastructure factor, and environment factor as the main causes of accidents [(2)].

The aim of this study is to review the investigation reports released by NTSC from 2011 – 2013 from human factors perspective. This study uses swiss-cheese model as a conceptual framework. The barrier is divided into unsafe acts factor and precursors of unsafe acts factor.

METHOD

This study employs a descriptive analysis based on the data from 21 investigation reports of road accidents in Indonesia from 2011 – 2013 released by NTSC Indonesia in their official website. The investigation reports contain the chronology of accident, the facts and information founded by the investigation team, the analysis from accident investigation team, the results of investigation, and the recommendations from the

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investigation result.

Besides the results of those reports, this study also carries out analysis by focusing on two barriers related to human factors perspectives, namely: Precursors of Unsafe acts factor and Unsafe acts factor [3]. Precursors of Unsafe acts factor consists of: Period of Accident (Days, Date, Month, and Year), Time of Accident (Day or Night), Location, Speed Zone, Type of Accident, Type of Vehicle, Weather Condition, Light Condition, and Road Condition. Unsafe acts factor consists of: Age, Sex, Road User Type, License Type, Vehicle Ownership, Driving Experience, Health Condition, Medical Condition, Fatigue, Seat Belt Used, Number of Injury, and Number of Fatality.

RESULTS

There are two parts of results from this study. The first one is Data Record. There are inconsistent Data Record from the reports of investigation. Not all investigation reports contain comprehensive data. Incomprehensive data applied to two factors: precursors of unsafe acts and unsafe act. precursors unsafe acts There are no data on the Speed Zone from the precursors of unsafe act. All reports did not mention anything about the speed zone that has been violated by driver. There are also incomplete data regarding the light condition and weather condition. There are 9 reports which did not mention the light condition, and there is 1 report which did not mention the weather condition. unsafe acts Incomplete data from unsafe acts factor consist of: Health Condition, Medical Condition, Seat Belt Used, License Type, Driving Experience, and Fatigue.

The second part of the result shows that Time, Crash Type, Vehicle Type, Light Condition, Road Condition, and Weather Condition constitute the factor levels of precursors of unsafe acts that are confined as the main issues related to human factor.

Table 1. Precursors of Unsafe acts Level Descriptions

Precursors Unsafe acts Factor	Factors	Number of cases	Percentage (%)
Days	Wednesday, Saturday, Sunday	4	19.05%
Date	Date 10	3	14.29%
Month	February	4	19.05%
Year	2012, 2013	8	38.10%
Time	Night (00.01 – 06.00)	10	47.62%
Location	West Java	8	38.10%
Accident Type	Crash	15	71.43%
Vehicle Type	Bus	14	66.67%
Weather Condition	Sunny	15	71.43%
Light Condition	Dark	9	42.86%
Road Condition	Asphalt	14	66.67%

From unsafe acts level, it can be seen that road user type and vehicle ownership constitute the two main factors in road accidents, while there are some other factors that yet to be also recorded.

Table 2. Unsafe acts Factor

Unsafe acts Factors	Factors	Number of cases	Percentage (%)
Age	31 – 40 years	7	33,33%
Sex	Man	21	100%
Road User Type	Driver	21	100%
Vehicle Ownership	Not ownership	21	100%
Fatality	8 – 16 persons *(∑ = 256 persons)*	15	71.43%
Injury	< 10 persons *(∑ = 396 injury)*	8	38.10%

DISCUSSION

Data recording remains to be big issues in road accident investigation. World Health Organization mentioned that data recording has become a problem in the investigation of road accident in Indonesia. In fact, there are no comprehensive recording between the years 2009 – 2010[4]. Incomprehensive data recording on accidents could reduce the accurateness of the investigation result and produce a misleading conclusion of the accident investigation. Human aspect as the main cause of road accident is based on the current model of investigation. Humans are treated as the main factor that contributes to road accidents. However, when we look from the perspective of human factors as a scientific approach in investigation, data recording on unsafe acts are minimum, while data on precursors of unsafe acts are more comprehensive. This means that it is too early to conclude that humans are the main factor in road accidents, as there are barrier levels of precursors of unsafe acts that still need to be observed and analyzed.

Reason (1997) expressed that accident is organizational risk. Human is part of organization with their limitations and capabilities [5]. If we look onto the study, there are still a lot of rooms for organizational barrier and defenses to analyze and explore in order to get a more comprehensive analysis of road accident. However, it is not easy to see road accident as an organizational accident. Data in organizational barrier are not available or not recorded [3]. Road users are not "organizational" group of people, unlike workers in a company or members in an organization.

The Road Accident Investigation Report published by NTSC Indonesia uses an epidemiological approach consisting of 4 factors: Human, Vehicle, Infrastructure, and Environment. Pratte (1998) mentioned that there are three main factors of epidemiological approach of road accident research, namely Human, Vehicle, and Environment. This model of Road Accident Investigation Report published by NTSC Indonesia uses similar approach that was proposed by Pratte [6]. Although, there are no data on Alcohol and Drug Used in Human Aspect, various studies show that blood alcohol level is correlated to road accident [7,8]. Other studies show that drugs and medical conditions also increases the risk of road accidents [9].

Despite all these, there is no data on the five supporting factors of Human Aspect recorded in the road accidents investigation report issued by NTSC. The five factors have, in fact, contributed to the numbers of accidents from the human aspect according to epidemiological approach. Several studies show that the positive alcohol level in the drivers' blood contributes positively to road accidents involving land transportations [7,8]. In addition to alcohol, other studies also find that the driving under the influence of drugs and certain medical conditions also constitutes a human aspect that plays a role in road accidents [9,10]. The data concerning health can be used as a material for further investigation on the role or contribution of human aspect in an accident.

The use of seatbelts constitutes one human-related factor that can reduce the rate of accidents. It is estimated that the use of seatbelts may reduce up to 40% - 60% risk of traffic accident (7). The investigation result issued by NTSC, however, does not include any data on the use of seatbelts.

With regards to age, studies conducted in developing countries found that drivers with older ages (over 70 years old) have minor contribution in traffic accidents. This can be caused by the small numbers of drivers that belongs to such age group or the lack of data thereon [6]. In the investigation result issued by NTSC, most drivers belong to to the productive age groups, ranging from 31 to 40 years old. This figure is quite different from the ones found in developed countries. For example, in

2003 the ratio of older drivers (aged > 75 years) was twice that of young drivers (aged 16 to 24 years), and in 2009 over 50% traffic accidents involved elderly driver [11]. Nonetheless, similar situation is expected to occur in Indonesia in the near future, and thus, measures to anticipate this are necessary.

CONCLUSION

Based on the analysis from human factor perspective, there are some external factors which have high contribution with road crash, such as accident type, vehicle type, weather condition, and road condition. Otherwise, there was less contribution from human factor due to the data of accident investigation for 2011 – 2013 were not comprehensive, particularly data about human factors (unsafe act). But, data record related precursor of unsafe act was more complete. This data will give misleading to see the causes of crass road from human factor perspective.

Conflict of Interest: NIL

Ethical Clearance: The study was approved by the Ethical Committee of Faculty of Public Health, Universitas Indonesia, Indonesia, with the approval number 366/UN2.F10/PPM.00.02/2018

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The Association between Eat Culture and Obesity among Adolescents in Tana Toraja

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ABSTRACT

Obesity is a new problem experienced by the world population, especially developing countries. Obese sufferers increase the risk of degenerative diseases, mental health and death. The aim is to analyze the cultural relationship between eating and the incidence of obesity in adolescents. This study was cross sectional survey by using purposive sampling to select samples. A total 79 adolescents were selected and investigated during this study. The result of this study shows a relationship between fast food consumption and the incidence of obesity ($p<0.001$). There is a significant relationship between food frequency and obesity ($p<0.001$). There is no correlation between food preference and obesity ($p=0.833$). Eat culture has a correlation with the incidence of obesity in terms of food consumption, meal frequency but not food preference. Food culture is closely related to local customs. Especially in fast food consumption and daily food preferences. It is suggested to adolescents to concern on their food consumption by knowing the principle of balanced consumption, and more intelligent in choosing the food that will be consumed.

Keywords: *Obesity, Eat Culture, Fast Food Consumption, Meal Frequency, Food Preference*

INTRODUCTION

Obesity has become a serious health problem in adolescents[1,2]. This obesity is the fifth leading cause of death in the world. Overweight has become a global pandemic throughout the world and is declared by WHO as the biggest chronic health problem. Obesity is caused by several factors, including genetic, socio-economic, behavioral and environmental factors[3-5]. The status of obesity in children to adults increases the risk of degenerative diseases and mortality[6]. Nowadays, social and cultural impact on changes in their "tastes" of food, from food choices, to eating patterns, it is increasing over time, in this case their choice of tastes is increasingly westernized[7].

Obesity has become a major health problem in recent years in Indonesia, the US and around the world[8]. Cases of obesity have increased for at least 5 decades, and the cause of the biggest mental illness[9]. Surveys in 13 countries and found that there was a significant relationship between depression and obesity[10]. Based on data from the International Obesity Unity shows that around 155 million school-aged children suffer from obesity worldwide[1].

Obesity in adolescents is also at risk for non-communicable disease (NCD)[4]. Obesity can increase the risk of diseases such as cardiovascular disease, diabetes, hypertension, dyslipidemia, and insulin resistance[11]. Being overweight in adolescents compared to normal

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weight (12-19 years) is at greater risk of developing cardiovascular disease, (5-15 years) experiencing an increase in glucose, blood pressure, insulin, and lipids and an increase in body mass. Metabolic symptoms have been diagnosed in 25% - 50% of pediatric obesity[12].

The number of obesity cases in adolescents and adults is worried for the government. Obesity and all its causes constitute a serious threat to the people of Indonesia. Based on data from Basic Health Research showed an increase in the prevalence of obesity in adolescents from 1.4% in 2007 to 7.3% in 2013. The prevalence of school-age children obesity in South Sulawesi in 2013 was 6.5% overweight and 4.2% obesity which is lower than the national figure of 10.8% over body weight and 8.0% obesity[13].

Obesity is one of the complex phenomena influenced by genetic, behavioral, environmental and family factors. The balance between energy intake and expenditure causes obesity. An environment that encourages lack of physical activity, and consumption of high-fat foods, high-carbohydrate foods support a positive energy balance. Less physical activity during childhood and adolescence and the influence of media are risk factors that influence the incidence of obesity in adolescents who are classified as children at age "at risk for overweight[14].

Accuracy about increasing the prevalence of obesity is very important for public health policies and programs to prevent related chronic diseases[15]. Eating habits are one of the important factors that influence the nutritional status of adolescents. Adolescents commonly do not know the effect of excessive eating patterns[16-18]. A good eating culture can reduce the incidence of illness and non-communicable disease. Modifying lifestyle can reduce the risk of the prevalence of disease in adolescents in Korea. Regional social and demographic factors are factors that cause disease[19].

Tana Toraja Regency is one of the regions in South Sulawesi that has a unique culture. This region is mountainous area that rich in natural resources and has many obese school-age children. The aim of the study was to investigate relationship between eating culture and the incidence of obesity in adolescents in Tana Toraja.

MATERIAL AND METHOD

This research was conducted in Tana Toraja from January to March 2018. The type of research was cross sectional study. Preliminary study was done before the main research conducted. 75 adolescents were selected by purposive sampling. Primary data includes characteristics of fast food, meal frequency, and food preferences. Data were obtained through interviews by using structured questionnaire, food frequency questionnaire, and repeated 24-hour recall food. Anthropometric data including body weight was measured using an automatic stepping scale with a capacity of 150 kg with a precision level of 0.1 kg. Whereas height is measured using microtoise with capacity 200 cm and accuracy 0.1 cm. Obesity status data was determined using body mass index for age z score (BAZ), then z-score was calculated using WHO Anthro Plus 2007 software. Univariate analysis was to see an overview of the characteristics of adolescents. Bivariate analysis and multivariate analysis were conducted to see the most significant variables on the incidence of obesity.

RESULTS

Table 1 shows the description of gender, age, and incidence of adolescent obesity. Based on the homogeneity test results showed that the obese and non-obese group had homogeneity (p>0.05).

Table 1. Characteristic of participant

Characteristics	Obesity status				Total	p*
	Obese		Non-obese			
	n	%	n	%		
Sex						
Male	6	17.1	29	82.9	35(100)	0.056
Female	10	25.6	29	74.4	39(100)	

Cont... **Table 1. Characteristic of participant**

Age						
13yo	3	27.3	8	72.7	11(100)	0,098
14yo	9	30.0	21	70.0	30(100)	
15yo	4	12.1	29	87.9	33(100)	
Weight						
45–50kg	2	6.3	30	93.8	32(100)	0,308
51–58kg	4	21.1	15	78.9	19(100)	
59–66kg	4	33.3	8	66.7	12(100)	
67–74kg	3	60.0	2	60.0	5(100)	
75–83kg	3	50.0	3	50.0	6(100)	
Height						
139–144cm	3	42.9	4	57.1	7(100)	0,750
145–150cm	2	10.0	18	90.0	20(100)	
151–156cm	4	25.0	12	75.0	16(100)	
157–162cm	6	30.0	14	70.0	20(100)	
163–168cm	1	9.1	10	90.9	11(100)	

*Homogeneity-test

The relationship of eat culture with the incidence of obesity in adolescents is presented in **Table 2**. Among obese adolescent, 39% consume fast food, 38.5% high food frequency, and 37% like for food preference. The habit of consuming fast food has a significant effect on the incidence of obesity with a value (p= 0.004*/0.004**). The frequency of eating has a significant and significant effect on the incidence of obesity with value (p= 0.010*/0.009**). Eating preferences have a significant and significant effect on the incidence of obesity with a value (p = 0.015*/0.014**).

Table 2. Relationship between eating culture and obesity

Variables	**Obesity status**				**Total**	**p**
	Obese		**Non-obese**			
	n	**%**	**n**	**%**		
Fast Food consumption						
Consume	11	39.3	17	60.7	28	0.004*
Not consume	5	10.9	41	89.1	46	0.004**
Eating frequency						
High	10	38.5	16	61.5	26	0.010*
Enough	6	12.5	42	87,5	48	0.009**
Food preference						
Like	10	37.0	17	63.0	27	0.015*
Dislike	6	12.8	21	87.2	47	0.014*

*Chi-Square **Paired Test

The variables that eligible to be included in multivariate analysis were fast food consumption, meal frequency, and eating preferences. The method used was ratio statistics and chi square test to see the risk and most related variables. Food preference variable was the most associated with obesity. Based on odds ratio analysis, consumption of fast food, frequency of eating, eating preferences 3 to 5 times more at risk for the incidence of obesity (**Table 3**).

Table 3. Multi logistic regression

Variable	B	p	Exp (B)	OR	95% CI
Fast Food consumption	3.732	0.000	41.753	5.306	5.672 - 307.360
Meal frequency	4.222	0.001	68.158	4.373	6.075 - 764.759
Food preference	4.782	0.000	119.372	4.020	8.595 - 1657.811

DISCUSSION

Fast food is generally produced using machines that are classified as foods that are high in carbohydrates and fat. Researchers in the United States find that alternative foods available in automatic machines have a negative effect on the quality of food in children[20]. In accordance with the conditions of fast food that is fried with savory flavors that exist in the Tana Toraja region in addition to containing high carbohydrates also contain fat. The fat consumed is not converted into energy because the carbohydrates consumed are not used up. As a result, there is accumulation of fat and carbohydrates simultaneously which may cause excess weight. The results of this study are similar to a study where the consumption of fast food, which has high energy density and glycemic load, and attracts teenagers to consume more portions, adversely affect weight gain and obesity[21].

The influence of the environment and the economic status of the family is proven to be a risk factor for obesity. Parents' knowledge that instills awareness of the importance of health in eating food, so teens are careful in selecting food. Almost every geographical area has at least one fast food restaurant. The presence of a fast food business near the residence encourages the desire to eat fast food. One of the factors driving the existence of a business entity that offers fast food is because the Tana Toraja area is very popular and is very much visited by tourists. This is what causes changes in food consumption behavior due to the availability of fast food. This study is supported by a research that exposure to fast food restaurants can be distributed in support of behavioral changes to sustained consumption of ready-to-eat foods[22,23]. A good method is used in the prevention of excess weight which will lead to highly recommended obesity by limiting consumption of fast food and providing knowledge about a healthier menu selection[23].

The availability of food also affects the frequency of eating teenagers, in addition to the consumption of food in the household also available fast food so that the frequency of eating more than 3 times a day and not balanced with physical activity, especially in young women. The choice of food type and meal portion can be caused by the time and place of research[24].

Excessive eating frequency can cause buildup because previously consumed food has not been used up as energy and continues to increase according to the frequency of eating for a day. Torajanese tradition in serving the average food contains high fat because the culture of the Toraja tribe is different from other tribes in Indonesia. This research is in line with the research of Lee et al. (2003) in Seoul Korea found that overeating was significantly associated and risked overweight in adolescents1. But contrary to previous research in Makassar Indonesia states that the frequency of meals has no real effect because the settings have been done correctly[24].

Parents play important role in the formation of eating habits and food preferences for their children. They can influence their children's food preferences by providing certain foods, as models and attitudes to certain situations[25]. It is important because children are vulnerable since unhealthy foods are provided in surrounding them, such as in the school[26].

Exposure to a variety of foods can encourage teens to choose the type of food available. The habit of providing food according to desire will encourage teenagers to choose these foods even though there are other types of food. The availability of food is influenced by family economic conditions. The high food preferences in adolescents are caused by the family's economic status. Adequate economic conditions tend to lead to excessive food purchases. This causes food to always be available as desired. Teenagers who come from families with higher income levels have different food preferences than children from low-income families[20].

Food preferences in Toraja adolescent are strongly supported by local traditions. Tradition where the deceased person will be celebrated with a luxurious custom party with food available is very high in carbohydrates and fat. This study supports the results of research in Korea which states that the selection of food among adolescents is influenced by the level of household income[27]. Good socio-economic status of the family causes an increase in the prevalence of obesity in children and adolescents in the United States[18].

CONCLUSIONS

Food culture is closely related to local customs. Especially in fast food consumption and daily food preferences.

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Analysis of Environmental Risk Factors and Dynamics of Transmission with Incidence of Filariasis in Kubu Raya District West Kalimantan Province

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ABSTRACT

Filariasis is a chronic infectious disease caused by filarial worm infection and is transmitted through the bite of various types of mosquitoes. The objective of this study was to analyze the environmental risk factors and the dynamics of transmission with the incidence of filariasis. The method used was observational analytic research with the case-control design. The sample size was 126 respondents with a ratio of case: control (1:2). The data collection was conducted by interview and observation. The results showed that there was correlation between the existence of swamp (P:0,000; OR:5,200), shrubs (P:0,001; OR:6,460), type of occupation (P:0,000; OR:9,500), level of knowledge (P:0,000; OR:5,399), the habit of doing an activity at night (P:0,000; OR:7,300), habit of using mosquito repellents (P:0,004; OR:3,300), habit of using mosquito net (P:0,000; OR:7,045), and the existence of a vector (P: 0,000; OR: 7,263) with the incidence of filariasis. Meanwhile, the logistic regression test showed the most significant risk factors on the existence of shrubs (*P*:0,002;OR:48,700), type of occupation (*P*:0,004; OR:39,919), level of knowledge (*P*:0,013; OR:11,206), the habit of doing an activity at night (*P*:0,040; OR: 5,833), habit of using mosquito repellents (*P*:0,005; OR:10,680), and the existence of a vector with the incidence of filariasis. It can be concluded that there was a correlation between environmental risk factors and the dynamics of transmission with the incidence of filariasis, thus, prevention efforts need to be conducted by reducing risk factors and educating the public about the efforts of promotion and prevention of filariasis transmission.

Keyword: *Filariasis, environmental risk factors, socio-cultural, dynamic of transmission, Kubu Raya District*

INTRODUCTION

Filariasis or often called elephantiasis is a chronic infectious disease caused by filarial worm infection and is transmitted through the bite of various types of mosquitoes. The worms are commonly in the lymph nodes, particularly in the groin and underarms as well as other large lymph nodes. The lymph nodes can be damaged and disrupted its function in tackling bacterial and fungal infections on the leg or hand injuries[(1)].

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Filariasis is one of the Negleted Tropical Desease (NTDs), which is a group of infectious disease infections caused by parasites, bacteria and viruses affecting more than one billion people worldwide. It is called neglected because it may survive exclusively in the poor population area, remote area, rural area, and urban slums [(2)].

Filariasis iscaused by three species of filarial worms, namely *Wuchereria Bancrofti, Brugia malayi* and *Brugia timori*, while the vector of the disease is mosquito. Nowadays, there are 23 species of mosquitoes from genus *Mansonia*, *Anopheles*, *Culex*, *Aedes*, and *Armigeres* which may act as potential filariasis vectors[(3)].

Filariasis infection that occurs in the communities can attack all ages, where people can be infected during the childhood with symptoms will be seen in the future. Moreover, filariasis can cause temporary or permanent disability. In endemic countries, lymphatic filariasis has major social and economic impacts with an estimated annual loss of 1 billion US dollars and destructs economic activity of up to 88% [4].

By 2015, more than 556 million people worldwide are treated for LF, and as many as 538 million people suffer from LF. The LF causes genital debilitating disease (hydrocele) in 25 million people and lymphedema or elephantiasis in 15 million people of which mostly women[5-6].

Filariasis is a chronic infectious disease caused by filarial worms and is transmitted by mosquito vectorssuch us *Mansonia*, *Anopheles*, *Culex*, *Armigeres*, particularly in warm or tropical climates[7]. The worms live in the lymph nodeswith acute clinical manifestations such us recurrent fevers and inflammation of the lymph nodes, at an advanced stage may cause permanent disability in the form of enlargement of the legs, arms, breasts and genital organ[8-9].

The disease is found in almost all parts of Indonesia such as in Sumatra, Java, Kalimantan, Sulawesi, Nusa Tenggara, and Papua, both urban and rural areas. The rural cases are found in eastern Indonesia, whereas urban cases are found in Bekasi, Tangerang, Pekalongan and Lebak (Banten). According to the results of the rapid survey in 2000, the number of chronic sufferers reported is 6,233 people that spread over 1,553 villages in 231 ditricts and 26 provinces[10].

West Kalimantan Province consists of 14 districts/ cities and 9 of which are filarial endemic areas. The number of chronic filariasis cases in 2014 is 268 patients, 2015 is 272 patients, and 2016 is 275 patients. The highest MF rate isin Kubu Raya District of 5.03% with the number of chronic filariasis cases of 56 patients[11].

In Kubu Raya District, the number of chronic filariasis case until 2013 is 52 patients, 2014 is 54 patients, 2015 is 56 patients, and 2016 is 56 patients [12]. The objective of this study was to analyze environmental risk factors and the dynamics of transmission related to filariasis incidence in Kabupaten Kubu Raya.

METHODOLOGY

This research was observational analytic research with the case-control design using retrospective study approach[13]. The case sample was 42 and the control sample was 84 (ratio 1:2). Research data were obtained by interviewing respondents about characteristic, type of occupation, behavior, and knowledge of respondents as well as observation of environment. The data were analyzed through statistical test analysis (chi-square) using a computer device to know the correlation of each variable with filariasis incidence.

RESULTS

Table 1 shows that of 126 respondents there were 64 (50.8%) respondents living close to the swamp, 111 (88.1%) respondents living close to the rice field, and 88 (69.8%) respondents living close to shrubs. Meanwhile, there were 55 (43.7%) respondents have aquatic plants around their house, 76 (60.3%) respondents have no predatory fish around their house, 35 (27.8%) respondents have risky vectors, 60 (47.6%) respondents have risky hosts, 80 (63.5%) respondents have risky type of occupation, 71 (56.3%) respondents have less knowledge, 33 (26,2%) respondents have habit of doing an activity at night , 43 (34.1%) respondents have habit of not using mosquito repellents, and 55 (43,7%) respondents have habit of using mosquito net.

Table1. Frequency distribution of variablesgroup of physical environment, biology and the dynamics of transmission with the incidence of filariasis in Kubu Raya District 2017.

Variable Group of Physical Environment, Biology and Dynamics of Transmission		Number (N)	Percentage (%)
The existence of swamp	Exist No	64 62	50,8 49,2
	Total	126	100

Cont... **Table1. Frequency distribution of variablesgroup of physical environment, biology and the dynamics of transmission with the incidence of filariasis in Kubu Raya District 2017.**

The existence of rice field	Exist	111	88,1
	No	15	11,9
	Total	126	100
The existence of shrubs	Exist	88	69,8
	No	38	30,2
	Total	126	100
The existence of aquatic plants	Exist No	55 71	43,7 56,3
	Total	126	100
The existenceodpredatory fish	Exist	50	39,7
	No	76	60,3
	Total	126	100
The existence of vectors	Risky Not Risky	35 91	27,8 72,2
	Total	126	100
The existence of hosts	Risky	60	47,6
	Not Risky	66	52,4
	Total	126	100
Type of occupation	Risky Not Risky	80 46	63,5 36,5
	Total	126	100
Level of knowledge	Less	71	56,3
	Enough	55	43,7
	Total	126	100
Habit of doing an activity at night	Risky	33	26,2
	Not Risky	93	73,8
	Total	126	100
Habit of using mosquito repellents	Risky	43	34,1
	Not Risky	83	65,9
	Total	126	100
Habit of using mosquito net	Risky	55	43,7
	Not Risky	71	56,3
	Total	126	100

Table2. Correlation between the existence of swamps, rice field, shrubs, type of occupation, level of knowledge, habit of doing an activity at night, habit of using mosquito repellents, and habit of using mosquito net with the incidence of filariasis in Kubu Raya District in 2017.

Variable		Incidence of Filariasis				p	OR	CI 95 %
	Yes		No					
	N	%	N	%				
The existence of swamps	Exist Not Exist	32 10	76,2 23.8	32 52	38.1 61.9	0.000*	5.200	2.255-11.991
The existence of rice fields	Exist Not Exist	41 1	97,6 2.4	70 14	83,3 16,7	0.041*	8.200	1.040-64.663
The existence of shrubs	Exist Not Exist	38 4	90,5 9.5	50 34	69.8 30.2	0.001*	6.460	2.111-19.771
The existence of aquatic plants	Exist Not Exist	23 19	54.8 45,2	32 52	38,1 61.9	0.112	1.967	.929-4.166
The existence of predatory fish	Not Exist Exist	20 22	47,6 52,4	30 54	35.7 64,3	0.274	1.636	0.771-3.472
The existence of vectors	Risky Not Risky	23 19	54.8 45,.2	12 72	14.385.7	0.000*	7.263	3.068-17.195
The existence of hosts	Risky Not Risky	25 17	59.5 40.5	35 49	41,7 58.3	0.089*	2.059	0.969-4.374
Tyoe of occupation	Risky Not Risky	38 4	90.5 9.5	42 42	50 50	0.000*	9.500	3.114-28.986
Level of knowledge	Less Enough	34 8	81 19	37 47	44 56	0.000*	5.399	2.234-13.048
Habit of doing an activity at night	Risky Not Risky	22 20	52,4 47.6	11 73	13,1 86.9	0.000*	7.300	3.038-17.541
Habit of using mosquito repellents	Risky Not Risky	22 20	52,4 47.6	21 63	25 75	0.004*	3.300	1.511-7.209
Habit of using mosquito net	Risky Not Risky	31 11	73.8 26.2	24 60	28.6 71.4	0.000*	7.045	3.057-16.238

Description* = Significant ($p < 0.05$) based on the continuity correction value[b]

Table 2 shows that there was a correlation between several variables and the incidence of filariasis, namely the existence of swamp (p-value: 0.000, OR: 5.200, 95%), rice field (p-value: 0.041, OR: 8.200) (p-value: 0.041, OR: 6.460), vector (p-value: 0.000, OR: 7.263) type occupation (p-value: 0.000, OR: 5.399), habit of doing night activity (p-value: 0.000, OR: 7.300), habit of using mosquito repellents (p-value: 0.004, OR: 3.300), habit of using mosquito net (p-value: 0.000, OR: 7.057), while the variables that did not show any correlation to the incidence of filariasis were the existence of aquatic plants (p-value: 0.112, OR: 1.967), predatory fish (p-value: 0.274, OR: 1.636) and hosts (p-value: 0.089, OR: 2.059).

Table 3. Final Modeling of Multivariate Analysis

Variable	B	*P*	OR	95% C.I.for EXP(B)	
				lower	Upper
Type of occupation*	3.687	.004	39.919	3.226	494.010
Level of knowledge*	2.416	.013	11.206	1.658	75.755
Habit of using Mosquito repellents*	2.368	.005	10.680	2.072	55.044
The existence of rice field	1.175	.537	3.239	.078	134.895
The existenceof shrubs*	3.886	.002	48.700	4.284	553.662
The existenceof vectors*	2.488	.005	12.036	2.092	69.231
The existence of hosts	.254	.737	1.289	.292	5.692
The existence of aquatic plants	-.473	.534	.623	.140	2.770
The existence of predatory fish	.779	.284	2.180	.524	9.061
Habit of using mosquito net	1.110	.130	3.034	.721	12.768
Existence of swamps	1.206	.112	3.341	.754	14.811
Habit of doing an activity at night *	1.764	.040	5.833	1.087	31.304
Constant	--28.077				

The results of multivariate test showed that the existence of shrubs, type of occupation, level of knowledge, habit of doing an activity at night, habit of using mosquito repellents, vector density are the dominant variables on the incidence of filariasis with OR = 48.700. Therefore, it can be predicted that the respondents who have shrubs around their house had 48.7 times greater chance to experience filariasis.

DISCUSSION

Correlation between the Existence of Swamps and the Incidence of Filariasis

The existence of swamp was associated with the incidence of filarias. It is in line with the study conducted by Nasrin[14], Ansari R [15], Santoso, Sitorus H, Oktarina R [16], stated that the existence of water puddle which is a breeding ground for vector mosquitoes may increase the risk of filariasis transmission in an area. The existence of swamp may be a potential place as a breeding ground for mosquitoes in which the mosquito density is higher because of aquatic plants such as kyambang (silvinia) and water hyacinth often found in swamps. Furthermore, mosquito density is higher in swamps, as it is a place favored by mosquitoes to breed[17].

Correlation between the Existence of Rice Field and the Incidence of Filariasis

The results showed that there was a significant correlation between the existence of rice field and the incidence of filariasis. This is in accordance with the study conducted by Ashari[15] who revealed that respondents living close to the rice fields with a distance of <100 m will have a risk to be infected with filariasis by 9.5 times greater than respondents living far away from rice fields. The rice field is one of the mosquitoes resting place so that the presence of rice fields is one of the risk factors of filariasis transmission where mosquitoes can rest after sucking human blood every day, however, however, the result of the research not in line with that conducted by Syuhada Y, Nurjazuli, Nur Endah W, Pekalongan in 2010, stated that the existence of rice fields is not associated with filariasis[18].

Correlation between the Existence of Shrubs and the Incidence of Filariasis

The existence of shrubs was associated with the incidence of filariasis. This is in accordance with the research conducted by Ardias [19],Ashari[15]. However, according to research conducted by Febrianto B, the existence of wild shrubs is not associated with filariasis incidence in Pekalongan District[20]. Furthermore, the study on transmigrants in Padang Pariaman District who came after the natives were treated, indicated that transmigrants whose settlements are closer to the forest [21] are more commonly infected with filariasis either clinically or through blood tests [21]. Most of the respondent's area still have shrubs around their house, this occurs because people live far apart with an agricultural land and plantation or the empty land which is one of the mosquitoes resting place around their houses

Correlation between the Existence of Aquatic plants and the Incidence of Filariasis

There was no correlation between the existence of aquatic plants and the incidence of filariasis. This is in accordance with the study conducted by Syuhada Y, Nurjazuli, Nurendah W [18]. This is because almost all respondents have ponds or a place to spawn fish containing aquatic plants around their house. However, Anshari[15]reported that aquatic plants are associated with filariasis incidence. The existence of aquatic plants will also affect the vector density, as it will make the water conditions to be more optimal for vector breeding and protecting vector from the predator. Furthermore, ecological factors such as temperature and humidity may also affect the vector density, thus it may increase the risk of filariasis transmission in an area [22, 48].

Correlation between the Existence of Predatory fish and the Incidence of Filariasis

The presence of predatory fish was not associated with the incidence of filariasis. This can be due to the results of observations found in the field in whichnot all water reservoirs such as ponds, ditches and puddles have predatory fish. Thus, the ability of various types of larvae fish (Blue panchax/*Pancha*xspp.) can not affect mosquito populations. Besides predatory animals, there are insects as enemy for adult mosquitoes, such as dragonflies, bats, lizards and so on, thus the frequency of mosquito bites on humans can be reduced[15]. However, the existence of predator is important in the prevention of mosquito larvae breeding in areas with a high vector density[23].

Correlation between the Type of Occupation and the Incidence of Filariasis

The type of risky occupation was associated with the incidence of filariasis. This is in accordance with the study conducted by Nasrin[15], Afra[21] in Padang Pariaman District. Occupation such as fishermen who have a habit of sailing at night can be infected by mosquitoes that breed on the shore. This is related to the habit of biting by mosquitoes at night [24]. In addition to fishermen, people with livelihoods as farmers can also be infected as they work in mosquito breeding spot which is a filariasis transmission such as in rice fields, swamps, and forests[25].

Correlation between the Level of Knowledge and the Incidence of Filariasis

The level of knowledge was associated with the incidence of filariasis. This is in line with the study conducted by Nasrin[15],and Marzuki[26] whopredicted that people who do not know about filariasis disease in endemic areas have a risk to be infected by 3.2 risk times greater than people who have a better knowledge. However, in contrast to the study conducted by Ardias in Sambas district, respondents who have less knowledge generally only know the habitat of mosquitoes. They do not know that filariasis is an infectious disease, how the symptoms of filariasis, causes of filariasis, filariasis prevention, time of mosquito eradication, and target of filariasis[19].The level of public knowledge or respondents, in general, can be improved through the provision of educational facilities and infrastructures by the government in order to gain the better knowledge.

Correlation between the Habit of doing an activity at night and the Incidence of Filariasis

The habit of doing an activity at night was significantly associated with the incidence of filariasis. This is in line with the study conducted by Kadarusman[27]; Windiastuti, Suhartono, Nurjazuli[28]who stated that respondents who have a habit of doing an activity at night have a chance to be infected with filariasis by 26.3 times greater than respondents who do not have the habit of doing an activity at night. This is similar to the study conducted by Amelia R [29] that habit of doing an activity at night has a correlation to the incidence of filariasis with value (p = 0.002; OR = 15.167). The habit of doing

an activity at night will open up greater chances to contact with *Anopheles* mosquitoes. Respondents should wear long dresses and trousers as well asusing mosquito repellents to minimize the risk of mosquito bite during outdoor activities at night [30].

Correlation between the Habit of Using Mosquito Repellents and the Incidence of Filariasis

The habit of using mosquito repellents was associated with the incidence of filariasis. This is in accordance with the study conducted by Ardias[19] who revealed that people who have habit of not using mosquito repellents have a risk to be infected with filariasis by 27.21 times greater than those who have a habit of using mosquito repellent. This finding is similar with the results obtained by Nasrin[14] Windiastuti, Suhartono, Nurjazuli[28]. One way to prevent mosquito bites is by using mosquito repellent which is self-protection method used by individuals or small groups in the community to protect themselves from mosquito bites by preventing contact between the human body and mosquitoes. This method is very useful because the equipment is small, easy to carry and used as well as simple in its use. The mosquito repellentsinclude anti-mosquito drugs that are applied by burning, and, spraying and rubbing [29].

Correlation between the Habit of Using Mosquito Net and the Incidence of Filariasis

The habit of using mosquito net was associated with the incidence of filariasis. This is in accordance with the research conducted by Ansari [15];Noerjoedianto[31]. The habit of using mosquito net at bedtime theoretically has contributed to the prevention of filariasis transmission, because in general the activity of biting by mosquitoes is highest at night. Several efforts to avoid the bite of mosquitoes include covering the room with wire screen and using bed nets. These efforts are recommended by the health ministry, particularly in areas that have a risk to be infected by filariasis[19].

Correlation between the Existence of Vector and the Incidence of Filariasis

The existence of the vector wasassociated with the incidence offilariasis. Astudy on mosquitoes shows that the infective form is mainly found in the mosquitoes caught in the fields near the forest [32]. How to reduce the contact between vectors and humans in rural areas has not been conducted, this is due toa little understanding of communities and the low economic status. The communities still do not understand the use of mosquito nets,they only wear mosquito nets when the weather is cold. In addition, the use of mosquito repellents such aslemongrass oilhas not been favored in Indonesia. Therefore, a good counseling on the importance of using mosquito repellents is still needed[33]. Several types of vectors are involved in filariasis transmission, including mosquitoes from the genus *Culex*, *Anopheles*, *Aedes* and *Mansonia*[47]. In Brazil, the only known vector is the mosquito from the genus *Culex*, which is commonly found in the study area [34].

Correlation between the Existence of Hosts and the Incidence of Filariasis

The existence of the hosts was not associated with the incidence of filariasis. In contrast to the theory of Bell.JC, that Brugiafilariasis is a zoonotic disease that can infect animals other than humans, namely: ape (*Macacafas cicularis*), lutung (*Presbythis cristatus*) and cat (*Felis catus*), while dog (*Canisfas cicularis)* is a reservoir for *Dirophilaria immitis*[35]. Cats, dogs and leaf monkeys are several known hosts that serve as reservoirs for the Brugian filarial parasite [36]. A number of reports published in zoonosis filariae involve cats from several countries including Thailand [37], Indonesia [38] Philippines [39], and other countries in Southeast Asia [40, 41].Based on the results of this study, the existence of the hosts is not associated with the incidence of filariasis, however, it is suspected that the existence of these animals plays a role in the dynamics of transmission of filariasis in Kubu Raya District. Therefore, it is necessary to conduct further research on these filarial hosts.

CONCLUSION

There is a correlation between the existence of swamps, paddy fields, shrubs, type of work, level of knowledge, habit of doing an activity at night, habit of using of mosquito repellents, habit of using mosquito net, and the existence of vector with the incidence of filariasis in Kubu Raya District. Socialization is recommended to the community regarding the attitude and behavior of communities in preventing the transmission of filariasis through community activities in the village involving community leaders, health workers and local village officials.

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Competing Interest: This research is part of final task of University of Indonesia students, thus, there is no competition in conducting this research.

Ethical Clearance: The study was approved by the Institutional Review Board (IRB) of Faculty of Public Health, Universitas Indonesia.

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Correlation between Food Hygiene Sanitation and Escherichia Coli (*E.coli*) Contamination on Snacks Sold around Elementary School in Jatiasih Subdistrict, Bekasi Indonesia

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ABSTRACT

Background*:* Snacks has an important role to provide nutrition for school-age children. However, they are vulnerable to contamination caused by pathogens such as bacteria. Food contamination can be caused by several factors, one of them is food hygiene sanitation. Therefore, this study aims to determine hygiene sanitation factors associated with Escherichia *coli (E.coli*) contamination on snacks sold at elementary schools located in Jatiasih Subdistrict, Bekasi, Indonesia. **Materials and Method***:* Subject of this study were 51 food handlers who sell snacks around elementary schools area. This study was a cross-sectional study and used primary data. Analysis data used chi-square test and regression-logistic test. **Findings***:* Results from Chi-square test indicate that there are association between food handler personal hygiene (OR = 4.500 [CI 95% 1.20 – 16.81]), food stall sanitation (OR = 5.146 [95% CI 1.243 – 21.30]), and food container (OR = 4.167 [95% CI 1.194 – 14.54]). Results from logistic regression test indicate that food stall sanitation (OR = 4.93) and cooked-food container (OR = 3.98) are the most dominant factors to *E.coli* contamination on snacks that are sold around elementary schools in Jatiasih Subdistrict, Bekasi. ***Conclusion*** The most dominant factor responsible for *E.coli* contamination on snacks at elementary schools, Jatiasih Subdistrict, Bekasi are food stall sanitation with OR = 4.93. Authors suggest stakeholders in Bekasi City should give counselling and training about hygiene sanitation for food handlers in every school, provide sanitation facility, and PPE for food handlers such as aprons and gloves.

Keywords*:* hygiene sanitation, *E.coli* contamination, snacks at elementary schools

INTRODUCTION

Foodborne diseases are acute or sub-acute non-infectious diseases caused by microorganisms or chemical agents entering the body through food.[18] If foodborne diseases attack high-risk groups such as infants, children, pregnant women, and the elderly, it can lead to death and disability of those risk groups.[10] Foodborne diseases become one of public health problems caused by poor food security. Food handlers play an important role in keeping the food safe and preventing contamination. Research by Monney et al (2013) urged that food handlers can contaminate food through poor hygiene practice, inadequate cooked food container, and poor sanitation.[12]

Bacteria that causes foodborne diseases can be transmitted through various stages in the food preparation process, such as contamination caused by infected animal feces, meat exposed to infected intestines, skin, or fur, and contamination during the food processing and serving.[13] One of pathogen used as an indicator of food or drink contamination is *Escherichia coli* (*E. coli*). It is stated in WHO data from 2007-2015, *Escherichia coli (E. coli)* bacteria are responsible for 1-3 million of DALYs caused by foodborne diseases, one of them is diarrhea.[19]

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Based on the Final Report of Monitoring and Verification of National Security Profile of PJAS (Snacks for Students) of 2008, 98.9% students buy snacks at school (Indonesia National Agency of Drug and Food Control.[3] However, snacks for students are susceptible to bacterial contamination resulting from poor sanitation and hygiene. In addition, result of research by Ministry of Health of Indonesia states that the highest contamination on Snacks for Students in Indonesia from 2009-2014 is caused by microbial contamination that is almost equal to 70% .[5]

Bekasi is one of big cities located in West Java, Indonesia. Based on the data of Bekasi Health Profile of 2016, it is indicated that diarrhea is still in the highest 5 major diseases that lead to illnesses and death in Bekasi. Based on the data, the morbidity rate of diarrhea of all age in Bekasi is 75,689 cases. Generally, the case of diarrhea occurs on the age group of 5-14 years.[6] Jatiasih Subdistrict is one of subdistricts with the highest number of diarrhea sufferers in Bekasi City. In September 2017, there was food poisoning at an elementary school in Jatiasih subdistrict, Bekasi. A total of 17 students simultaneously experienced nausea, vomiting, and diarrhea after consuming one of the snacks sold at school.[7]

The problems are snacks for students are vulnerable to contamination caused by disease-carrying bacteria such as *E.coli*. This study aims to analyze the contamination of *E.coli* in snacks for students in Jatiasih subdistrict, Bekasi, and relate it to factors that influence *E.coli* contamination on snacks for students, which are hygiene and sanitation.

MATERIALS AND METHOD

The research use cross-sectional design. It was conducted at Elementary Schools in Jatiasih sub-district, Bekasi. Data collection was conducted in April to May 2018. Data collection of *E.coli* contamination on snacks for students was determined through food sampling and laboratory tests using *Total Plate Count* (TPC) method with a medium of CCA (*Chromocul Coliform Agar*). Data related to hygiene sanitation factor was obtained from interview using questionnaire. While handler's personal hygiene, food stall sanitation, utensils sanitation and cooked food container and food serving were conducted using observation checklist instrument.

The sampling technique used in this research was total sampling. The sample criteria were food handlers at elementary schools in Jatiasih subdistrict, Bekasi and vendors selling snacks that contain high water and high protein. The number of samples were 51 food handlers and 51 snack samples. Snacks with high water and high protein were chose as the sample criteria based on the types of food that were susceptible to bacterial contamination, one them was food that contain high water and protein.

Data processing was performed on SPSS Statistic 19. The data was analyzed in univariate, bivariate, and multivariate analysis. Univariate analysis was performed to show the frequency distribution of each research variable. Bivariate analysis using Chi-square test was conducted to find out the correlation between independent and dependent variables with the confidence interval of 95%. In addition, multivariate analysis was conducted using multiple logistic regression test to find the most dominant variable that cause *E.coli* contamination on snacks in Jatiasih subdistrict, Bekasi.

FINDINGS

From the results of laboratory examination, 16 (31.4%) types of snacks sold around 47 elementary schools in Jatiasih Subdistrict, Bekasi are positively contaminated with *E.coli*. It is found that the knowledge related to food hygiene sanitation of 17 (33.3%) food handlers is poor. Food handler personal hygiene of 26 (51.0%) food handlers is poor. Food stall of 29 (56.9%) food handlers is poor. Utensils sanitation of 32 (62.7%) food handlers is poor. Cooked-food container of 20 (39.2%) food handlers is poor. Meanwhile, food serving of 23 (45.1%) food handlers is poor (**Fig 1**).

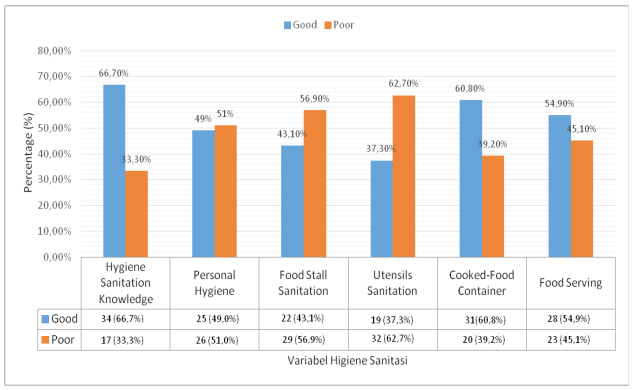

Fig 1. Univariate Analysis on Hygiene Sanitation of Snacks for Students at Elementary Schools in Jatiasih subdistrict, Bekasi, of 2018

The correlation between hygiene sanitation and *E.coli* contamination variables on snacks was found through *Chi-square test.* It is found that there is a significant correlation between food handler personal hygiene (OR = 4,500 [95% CI 1.20-16.81]), food stall sanitation (**Fig. 2**), and cooked food container (**Fig. 3**). Then, logistic regression test was conducted to determine the dominant factor that is affecting *E.coli* contamination on snacks among the three independent variables which are significant in bivariate analysis.

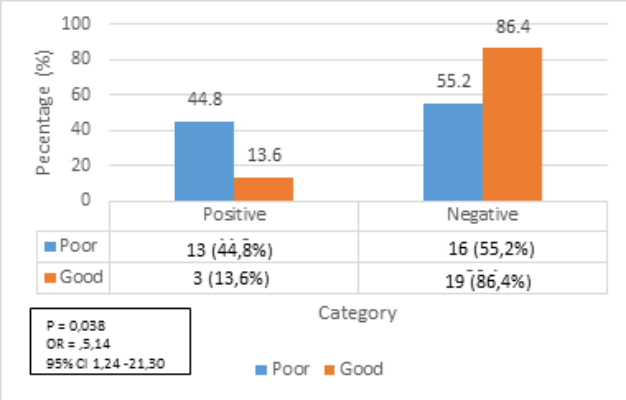

Fig 2. Correlation between *E.coli* Contamination and Food Stall Sanitation in Jatiasih, Bekasi

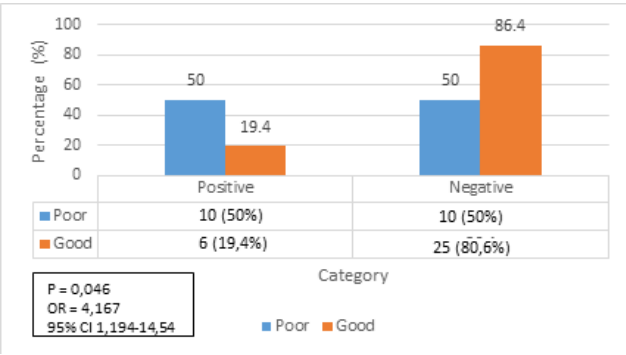

Fig 3. Correlation between *E.coli* Contamination and Cooked Food Container in Jatiasih Subdistrict, Bekasi

From the results of logistic regression test, it can be interpreted that the food stall sanitation (OR = 4.932; 95% CI 1.125-21.62) and cooked food container (OR = 3.985; 95% CI 1.062-14.94) simultaneously affect *E.coli* contamination on snacks sold around elementary schools in Jatiasih subdistrict, Bekasi, altogether with other independent variables. After performing the logistic regression test, the logistic regression model equation is as follows:

B value on food stall sanitation (b1x1), cooked food container (b1x2), and Constant (a) variables is obtained from the following equation (**Equation 1**):

The logistic regression test was then followed by the interaction test. Interaction test was conducted with the aim to determine whether there is any substantial interaction among independent variables, moreover variables are said to have interaction if $p<0.05$. From the interaction test result, there is no interaction among each independent variable .

Based on the results of logistic regression test, it is found that the sanitation variable which food stall sanitation is the most significant factor or has a significant correlation with *E.coli* contamination on snacks at Elementary schools in Jatiasih Subdistrict, Bekasi.

From the results of this research, it is known that *E.coli* contamination on snacks at elementary schools in Jatiasih Subdistrict, Bekasi is quite high that 16 of 51 samples (31,4%) are contaminated with *E.coli* bacteria. The presence of *E.coli* on food can be indicated by cross-contamination.

Cross-contamination causes *E.coli* from human feces to be in various places through various vectors, namely fly, human hand, and environment media such as soil and water.[8] *E.coli* found on food can be caused by several factors, such as poor hygiene practice during cooked food container, poor hygiene behavior when serving food, inappropiate food heating temperature, poor storage sanitation, and poor sanitation facilities.[2]

This study indicates that there is a significant correlation between food handlers personal hygiene regarding *E.coli* contamination on snacks. Based on research conducted by Baluka, et al (2015), the presence of bacteria on food served in restaurants located in Uganda is caused by the handler's poor hygiene practice.[4] Todd et al (2008) urged the risk of food contamination caused by microorganisms is affected by the hygiene practice and knowledge of food handler. [17]

The number of food handlers who does not behave well is high because there are many food handlers who do not wear personal protective equipment (PPE) when serving food, such as gloves (100%) or apron (96.1%). In addition, most food handlers do not wash their hands before and after serving food (94.1%).

From the results of in-depth interviews, food handlers do not feel the necessity to wear gloves or aprons as it is considered to inhibit the process of food serving. Poor hygiene practices such as not wearing hair

cover and gloves, having long nails, and wearing hand jewelry can cause cross-contamination.[16]

Food stall sanitation also has a significant correlation to *E.coli* contamination on snacks. A research urged that poor sanitation affects the emergence of bacteria that cause foodborne diseases such as *Campylobacter, Salmonella, Staphylococcus aureus, Bacillus cereus* and *Escherichia coli*.[9] Based on FAO data (1997), poor infrastructure of food management, lack of clean water source, poor sanitation facilities, and environment conditions that is not suitable for food may contribute to the quality of bacteria on food.[11] In addition, the environment around unsanitary selling places can be breeding sites for vectors like flies.[15]

Street vendors and snack shops around elementary schools in Jatiasih subdistrict, Bekasi tend to sell food in open space or at the side of the road which is easily exposed to dust and odor, and several locations of street vendors are close to open trash cans and wastewater channels (62.7%), so that many flies are found around that place. Some canteens in elementary schools are not facilitated by adequate sanitation facilities such as lid trash can (90%) as well as sink (78.4%).

Cooked food container variable becomes one of the factors that is affecting *E.coli* contamination on snacks. There are numerous food handlers at Elementary Schools in Jatiasih Subdistrict, Bekasi who do not cover the food, so it causes contamination by the environment. Microorganisms, including pathogenic diseases, may increase when utensils, such as knives and food containers are cleaned inappropriately or unsanitary.[1] In addition, food stored in food containers tends to be easily contaminated with pathogenic microorganisms and it also reduces the quality of food.[14]

Generally, food handlers around Elementary schools in Jatiasih Subdistrict, Bekasi are still using open containers to keep their cooked food (66.7%), moreover open food containers tend to be placed close to the source of pollution (76,5%).

CONCLUSION

It is found that 16 (31.4%) snacks sold in 47 elementary schools, Jatiasih subdistrict, Bekasi are positively contaminated with *E.coli*. There is a significant correlation between personal hygiene, food stall sanitation, and cooked food container variable. The most dominant factor responsible for *E.coli* contamination on snacks at elementary schools, Jatiasih Subdistrict, Bekasi are food stall sanitation with OR = 4.93 and cooked food container with OR = 3.98. Quality improvement of hygiene sanitation and snacks sold around Elementary schools in Jatiasih Subdistrict, Bekasi needs to be conducted thoroughly to prevent the occurrence of *E.coli* contamination on snacks for students. Community Health Center, Health Department, Elementary Schools and vendors around schools can work together to create a good hygiene sanitation in serving snacks for students.

Moreover, the provision of adequate sanitation facilities such as lid trash cans and sinks, counseling or training regarding hygiene sanitation to food handlers at schools, regular inspection on food stalls around schools by Community Health Center or Health Department, wear aprons and gloves when serving food, use closed and clean cooked food containers, and implementation of clean and healthy behavior both for food handlers and consumers are some efforts that can be done to prevent the occurrence of *E.coli* contamination on snacks for elementary school students. It is also suggested that containers used to place cooked food are not made of hazardous materials and have no defect or damage.

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Ethical Clearance: This research‘s number of ethical approval from the Ethical Research Committee is 129/UN2.F10/PPM.00.02/2018 dated March 19th 2018.

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Hypertension in Chefs: Prevalence and Relationship with the Characteristics of People

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ABSTRACT

Hypertension is the closest trigger factor for cardiovascular disease while cardiovascular disease is the leading cause of death in the world. This study is aimed to determine the prevalence of hypertension based on the characteristics of chefs. This type of research is quantitative, with a cross-sectional study design, using 80 chefs as samples determined by purposive sampling. Data collection of this research used a questionnaire, blood pressure measurement using a Sphygmomanometer tool, body mass index (height was measured using microtoise which has an accuracy of 0.1 cm Chi Square test and T-test with 95% CI and significant level $\rho < 0.05$. The average study subjects had systole blood pressure 131.30 with an average dispersion from the sample of 16.51 and diastole blood pressure 81.39 with an average dispersion of 12.02. Normotensive prevalence, pre-hypertension and hypertension had scores of 22.5%, 46.3%, and 31.3%. An increase of awareness for a healthy lifestyle is needed in order to prevent an increase of hypertension cases among informal sector workers, especially chefs.

Keywords: *Prevalence, Normotension, Pre-hypertension, Hypertension*

INTRODUCTION

The international community has issued a declaration to reduce the rate of hypertension by up to 25% by 20251. Nevertheless, WHO data in 2011 shows that globally hypertension has attacked one billion people and 2/3 of them are in developing countries with low to moderate income2 and it is estimated that the figure will continue to increase until 20253. Hypertension in Indonesia also experienced an increase in cases with the prevalence of national hypertension based on Riskesdas 2013 of 25.8%3, but in 2016 the results of the National Health Indicators Survey (Sirkesnas) based on coverage data at the District / City Health Office and Puskesmas refer to year records 2015 the prevalence of high blood pressure in the population aged ≥18 years was 32.4 percent4.

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The results of data collection collected by Pusdatin show that the prevalence of hypertension in Indonesia in 2013 in the population aged 18 years and over, based on the diagnosis of health personnel by 9.4% and based on blood pressure measurements by 25.8%. The islands of Sulawesi and Kalimantan are provinces with a high prevalence of hypertension, while the prevalence of coronary heart disease, heart failure and stroke in several provinces in Sulawesi and Kalimantan also have a high enough number5.

Hypertension is the closest trigger to some types of cardiovascular diseases such as stroke and ischemic heart disease6,7. Ignorance of hypertension risk factors results in the majority of the public being unaware of their health conditions associated with hypertension6,8. Currently, hypertension does not only attack the elderly, but also it attacks adolescents to adults9. Although it is known that genetic factors play an essential role in the case of hypertension, nevertheless, currently unhealthy lifestyles are the main trigger factors for hypertension, such as consuming foods that are high in saturated

fat and using sodium and sugar salt, lack of exercise, low fibrous food, and smoking habits and consuming alcohol2,10.

Working can be one of the risk factors for hypertension like the relationship between noisy work environment11, stress12 with hypertension, has been known. A study behind this study found a high prevalence of hypertension in the group of chefs compared to other groups of workers13. This study is aimed to further identify the prevalence and risk factors of hypertension in chefs in food stalls as well as factors that can be used as predictors of the occurrence of hypertension.

MATERIALS AND METHODS

This study belongs to quantitative with a cross-sectional study design, using a sample of 80 chefs determined by purposive sampling, with the inclusion criteria of respondents who have worked as chefs for 2 years and are willing to take part in this study. Data were collected using a questionnaire for factors related to hypertension in the form of gender, age, education level, marital status, ethnicity, dietary physical activity, smoking habits, and Body Mass Index. Blood pressure measurement using the Sphygmomanometer tool, body mass index (height was measured used microtoise which has an accuracy of 0.1 cm); body weight was measured with a stepping scale. Data processing was done using SPSS version 20 for Windows and analyzed using Chi Square test and test T-test with 95% CI and significant level $\rho < 0.05$.

RESULTS

The frequency distribution of respondents' characteristics in table 1 shows the largest percentage of the chef is female. The largest age group is 26-45 years old, married, has a low education level, and the most ethnic group is Toraja. It can be seen that the characteristics that have a significant relationship with systolic blood pressure and diastole are only with the characteristics of age and marital status.

Table 1. The average blood pressure of Systole and Diastole based on the respondents' characteristics

Characteristics	Systole ρValue (Mean±SD)	Diastole ρValue (Mean±SD)	n(%)
Sex	0.165	0.578	
Male	134.29±17.53	82.26±14.85	34(42.5)
Female	129.09±15.53	80.74±9.53	46(57.5)
Age	0.000	0.001	
> 45	141.54±16.11	87.04±9.27	24(30.0)
26 - 45	130.32±14.65	81.41±12.24	41(51.2)
17 – 25	117.60±10.69	72.27±10.09	15(18.8)
Marital Status	0.021	0.005	
Married	133.58±17.18	83.39±12.19	62(77.5)
Not married	123.44±11.06	74.50±8.58	18(22.5)
Education Level	0.199	0.449	
Low	130.40±15.53	81.00±11.81	70(87.5)
High	137.60±22.18	84.10±13.78	10(12.5)
Tribes	0.244	0.218	
Bugis/Makassar	127.31±22.87	75.31±18.131	13(16.3)
Toraja	136.65±16.43	83.85±11.83	26(32.5)
Jawa	128.90±14.71	81.62±8.40	21(26.3)
Others	129.45±12.64	81.90±10.04	20(25.0)
TOTAL	131.30±16.51	81.39±12.02	80(100)

Overall, the average subject has systole blood pressure of 131.30 with an average dispersion from the sample of

16.51 and diastole blood pressure of 81.39 with an average dispersion of 12.02. Furthermore, Table 1 also shows that based on respondents' characteristics. The highest systole and diastole blood pressure were found in the age group of > 45 years (141.54/87.04) followed by respondents from the Toraja tribe (136.65/83.85).

Table 2. Prevalence of Blood Pressure and Its Relation to Some Variables

Variables	Normotension (%) (<120/<80 mmHg)	Pre-hypertension (%) (≥120/≥80 mmHg)	Hypertension (%) (≥140/≥90 mmHg)	n	ρValue
Sex					
Male	5(14.7)	17(50.0)	12(35.3)	34	0.352
Female	13(28.3)	20(43.5)	13(28.3)	46	
Age					
> 45	2(8.3)	7(29.2)	15(62.5)	24	0.000
26 - 45	8(19.5)	23(56.1)	10(24.4)	41	
17 – 25	8(53.3)	7(46.7)	0(0.0)	15	
Marital Status					
Married	12(19.4)	27(43.5)	23(37.1)	62	0.042
Not Married	6(33.3)	10(55.6)	2(11.1)	18	
Education Level					
Low	16(22.9)	33(47.1)	21(30.0)	70	0.604
High	2(20.0)	4(40.0)	4(40.0)	10	
Tribe					
Bugis/Makassar	5(38.5)	5(38.5)	3(23.1)	13	
Toraja	3(11.5)	12(46.2)	11(42.3)	26	0.859
Jawa	4(19.0)	12(57.1)	5(23.8)	21	
Others	6(30.0)	8(40.0)	6(30.0)	20	
Stall Ownership					
Owner	3(9.7)	16(51.6)	12(38.7)	31	0.086
Not owner	15(30.6)	21(42.9)	13(26.5)	45	
Smoking activity					
Not smoking	14(26.4)	23(43.4)	16(30.2)	53	0.496
Smoking	4(14.8)	14(51.9)	9(33.3)	21	
Total	18(22.5)	37(46.3)	25(31.3)	80	

Chi Square test, $\rho < 0.05$

Normotension prevalence, pre-hypertension and hypertension in table 2, based on the characteristics, show that the age group> 45 (62.5%) has the greatest prevalence of hypertension. While the greatest prevalence of pre-hypertension by subjects with the Javanese (57.1%). Ages 17-25 years were the group of subjects who had the largest Normotension prevalence (53.3%). There is a significant relationship between age with hypertension status (ρ = 0,000) and marital status with hypertension status (ρ = 0.042).

DISCUSSION

The increase of blood pressure that exceeds the threshold value, is a trigger for hypertension. It is characterized by an increase in systolic and diastolic blood pressure, mostly experienced by the old age group2, as illustrated in table 1, the age group > 45 years is a group of subjects who have high blood pressure both in systolic and diastole blood pressure. Nevertheless, this is undeniable because systolic blood pressure usually increases with a person's age even though diastolic blood pressure only increases up to the age of 50 years after that will decrease with age14.

The second highest group of systolic and diastolic blood pressure is the Toraja tribe in South Sulawesi.

The Toraja is a tribe, whose food habits have a close relationship with the local customs. Consumption of foods that are mostly derived from animal fats and high in salt and flavoring ingredients are the characteristic of Toraja food, so it can be said that eating habits can lead to an increase in systolic blood pressure15,10. The results of the same study in the Minangkabau tribe in West Sumatra showed an association between fat consumption and systolic blood pressure ($p < 0.05$)16.

Hypertension is one of the risk factors that greatly contribute to the incidence of cardiovascular disease. Based on the results of the study, pre-hypertension has the highest prevalence value (46.3%). The term pre-hypertension was first introduced by the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High BP (JNC VII), which defines pre-hypertension as a blood pressure status with a range of 120–139 / 80–89 mm Hg17. Pre-hypertension is a group that is at risk for hypertension which will eventually develop towards cardiovascular disease because every increase of 20/10 mmHg, the risk of developing cardiovascular disease will increase two folds18.

High prevalence with hypertension status at the age of > 45 years (62.5%), along with increasing age will tend to increase7,14. This situation will be further aggravated if someone with hypertension has also other risk factors such as diabetes19, being overweight20 and smoking activity14. Age is a risk factor that has a very significant relationship with hypertension, as well as marital status. Some research results indicate that there is a significant relationship between marriage and stress while it is known that stress is also one of the triggers of hypertension21. With the existence of a very significant relationship, the chances of experiencing cardiovascular disease will be even greater. Overcoming in terms of changes in lifestyle becomes essential to be done so that an increase in blood pressure and an increase in cardiovascular disease can be controlled.

CONCLUSION

The average study subjects have a systole blood pressure of 131.30 with an average dispersion from the sample of 16.51 and diastole blood pressure of 81.39 with an average dispersion of 12.02. Normotension prevalence is scored 22.3%, 46.3% prehypertension and 31.3% hypertension with varying percentages in each characteristic. However, the characteristics of age and marital status have a significant relationship with hypertension.

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Profile of Bile Duct Injuries Following Laparoscopic Cholecystectomy

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ABSTRACT

Introduction: Laparoscopic cholecystectomy procedure was the gold standard for symptomatic cholelithiasis and cholecystitis, but it was associated with a higher incidence of bile duct injury than an open approach. **Methods***:* Retrospective study of bile duct injuries cases at Wahidin Sudirohusodo Hospital Makassar in 2017. **Results:** ***A*** total of 111 laparoscopic cholecystectomy patients, 71 women and 40 men, median age of 46 years. 13 patients conversion an opened cholecystectomy resulted in severe adhesion 76.9% (10 patients), bleeding 7.6% (1 patients) and bile duct injury 15.4% (2 patients). Of four patients, 3.6% had bile duct injuries which discovered during operation 2 patients (50%) had significant leak bile symptoms and discovered postoperative other two patients (50%) had biloma as the major symptom. Two patients had right hepatic duct injuries (Strasberg type C), then treated with biliary drainage; one patient had a lateral wall injury to the common hepatic duct (Strasberg type D, then treated with T-tube drainage; and 1 patient had transected to the common hepatic duct (Strasberg type E2), then reconstructed with Roux en Y hepaticojejunostomy. Regarding the Clavien–Dindo classification, of 4 bile duct injuries patients, 75% (3 patients) were classified as grade III b, respectively, 25% (1 patient) as grade III a.

Conclusion: Laparoscopic cholecystectomy had become the treatment of choice for symptomatic cholelithiasis, and it was associated with an increase bile duct injury incidence. Despite increasing awareness of this problem, yet more attention should be concerned both related to preventive care and early recognition of such injury care.

Keywords: *Laparoscopic; cholecystectomy; bile duct injuries; complications; biloma.*

INTRODUCTION

Laparoscopic cholecystectomy was the gold standard procedure for the management of symptomatic gallbladder stones or acute cholecystitis.[1] Although there were significant benefits related to the method, such as less pain and shorter hospital length of stay. However, the laparoscopic procedure had some weakness, as some publications, it was associated with higher incidence of bile ducts injuries compared with an open cholecystectomy era.[2] Bile duct injury following cholecystectomy was an iatrogenic catastrophe related to significant preoperative morbidity and mortality and less survival and quality of life, and high rates of subsequent litigation. Therefore, it should be regarded as preventable care.[3,4] So far, this had not been documented, as some studies had shown increased risks [5], while others could not verify this.[6] At Wahidin Sudirohusodo Hospital, researchers initiated a retrospective study of bile duct injuries following laparoscopic cholecystectomy during 2017. The purpose of this article was to evaluate the incidence and risk factors and analyze treatment options for this patient group.

METHOD

This research represented a retrospective database of cholecystectomy patients who developed bile duct injuries after laparoscopic cholecystectomy procedures from January to December 2017 at WahiddinSudirohusodo Hospital. The hospital was a teaching hospital in Makassar. During the period January to December 2017, laparoscopic cholecystectomies procedure were performed for 110 patients at this hospital, and and then investigated the incidence of bile duct injuries. These data were obtained from the patient medical register.

Data about bile duct injuries were retrospectively retrieved from the hospital's patient files and entered into a database. The severity of the injury was classified according to Dindo, Demartines and Clavien, 2004.[7] And type of injuries according to Strasberg 2002).[8] A part of the following of first postoperative month, there were no regular planned visits. All patients were tracked until death or were screened by 31 December 2017.

RESULTS

During the study period, 111 patients—40 men and 71 women— had laparoscopic cholecystectomy procedures during that period. The median age was 46 (range 14–77) years old. Out of 111 patients, 13 patients converted to open cholecystectomy because of severe adhesion 76.9% (10 patients), bleeding 7.6% (1 patients) and bile duct injury 15.4% (2 patients). A general overview of patient characteristics is shown in Table 1.

Table 1: General Characteristics of Laparoscopic Cholecystectomy Patients

	n	%
Sex		
Men	40	36
Women	71	64
Primary operation		
Laparascopic Procedures	98	88.3
Converted	13	11.7

Source: Primary Data, 2017

Four patients had a bile duct injury compared with the total incidence of bile duct injuries was 3.6% with the median age was 50 (range 45-57) years old. A 45-year- old woman with obesity as a risk factor leaked what assumed to be an aberrant bile duct (Strasberg type C) while dissecting the gallbladder from the hepatic bed that was discovered during the primary laparoscopic operation. She underwent a ligation to the duct and placed an intraabdominal drain. While other an obese 57-year-old woman had a tangential injury to the common hepatic duct that was discovered during the primary laparoscopic operation and repaired with an open Roux en Y hepaticojejunostomy. A 49-year-old woman with cholecystitis as a risk factor underwent an open operation 11 days after laparoscopic cholecystectomy due to a giant biloma. From intraoperative cholangiography, the leak was assumed from the lateral wall to the common hepatic duct (Strasberg type D. She was treated with the placement of a T-tube. The last patient, a 52 years woman with a history of several lower abdominal operation before underwent percutaneous biliary drainage ten days post laparoscopic cholecystectomy after we found biloma on abdominal computed tomography. The leak was assumed as an aberrant bile duct (Strasberg type C). A general characteristic of 4 patients with bile duct injuries is shown in Table 2,3,4 and 5.

Table 2: General Characteristics of Bile Duct Injuries Patients

	N	%
Sex		
Men	0	0
Women	4	100
Risk factor		
Cholecystitis	1	25
Obesity	2	75
History of abdominal operation before	1	25

Table 3: Strasberg Classification of bile duct injuries

Type	N	%
A Cystic or aberrant ducts	0	0
B Partial occlusion of the biliary tree	0	0
C Abberant duct without continuity with the CBD	2	50
D Lateral damage extrahepatic duct	1	25
E1 CBD > 2 cm from hepatic confluence	0	0
E2 CBD < 2 cm from hepatic confluence	1	25
E3 Hepatic confluence	0	0
E4 Division of right or left hepatic duct	0	0

Table 4: The severity of the injury was classified as Clavien Dindo

Grade	N	%
I No pharmacological treatment need	0	0
II Requiring Pharmacological treatment	0	0
III Requiring surgery IIIa Not under general anesthesia IIIb Under general anesthesia	 1 3	 25 75
IV Life threatening	0	0
V Death	0	0

DISCUSSION

Incidence and Risk Factors

In this research, we found a frequency of 3.6% bile duct injuries. Chuang et al., 2012 found risen from 0.1-0.5% for open cholecystectomy to 3% for Laparoscopic cholecystectomy.[9] Risk factors for BDI were related to the surgeon, patient and local pathology. The experience and learning curve of the surgeon was an essential factor in the reduction of bile duct injuries.[10] Some patients factors were related to obesity, age, and gender. The problem of morbid obesity in the laparoscopic procedures was considerably different from patient to patient. Some patients presented fewer problems compared with the open operation, whereas others were less easy resulted from their internal fat deposition which obscures the anatomy of Calot's triangle. Fatty hepatics could be challenging to elevate and were easily lacerated. Although increased age and male gender are associated with an increased postoperative mortality rate after cholecystectomy, they are not significant risk factors for significant bile duct injuries. However, local factors included "dangerous anatomy" and "dangerous pathological conditions" predisposing to biliary injury. They were presented in 15-35% of injuries, but since there were no comparable cases without biliary injuries, conclusions based on statistical comparisons were not possible. Dangerous anatomy included aberrant (anomalous) anatomy and pathological conditions that obscured the view of vital structures such as adhesions, inflammatory phlegmon, and excessive fat in the porta hepatis. Adhesions from previous abdominal operations and pathological conditions such as inflammation can distort the anatomy and predispose to injury. Undoubtedly, however, some technical errors were made during the 'easy' cholecystectomy with normal anatomy because of 'lack of care.[11,12] In this research, chronic cholecystitis with adhesions and obesity were the most commonly reported postoperative problems encountered.

Mechanism of Injury

The safe execution of both open and laparoscopic cholecystectomies relied on similar operative principles, despite some different approaches. In this research, all of bile duct injuries resulted from technical errors. Two cases of injuries were the lumen of the common hepatic duct injuries which were due to manipulation or forceful "dilatation" when secured the cystic duct or cystic artery. The other two cases injuries were the accessory right hepatic duct due to too broad a dissection plane on the hepatic bed during detachment of the gallbladder.

Converted operations

In adopting LC as the routine option, it could be stressed that the need for conversion was encountered for 20-25% of cases. There were two types of conversions: a conversion for safety and a conversion by necessity. Operations converted selectively after an initial laparoscopy, or shortly after prior trial dissection when progress under laparoscopic conditions was deemed hazardous and had the same risk as an open procedure. However, operations which "forced" surgeon converted process as it was due to a complication and significantly higher risk of biliary injury compared with open surgery. A French audit showed that the most frequent causes of conversion were acute cholecystitis, duct stones, and contracted gallbladder, while the most frequent reasons of transformation for technical difficulty was a hemorrhage. Conversion in the presence of difficult anatomy directly reflected common sense and good judgment; 'the object of the procedure should be completed to the cholecystectomy by the most appropriate. It meant not by laparoscopy at all costs. [13,14]

As many as 11.8% of the 111 operations in this research were a conversion from laparoscopic to open surgery because of severe adhesion 76.9% (10 patients), bleeding 7.6% (1 patients) and bile duct injury 15.4% (2 patients). All of the converted operations were made by necessity.

Surgical Management

The time of diagnosis following before biliary

tract injury and classification (which included the extent and level of the injury) was critical for optimal treatment. Several injuries could create short-and long-term complications (intra-abdominal fluid collections and biliary fistula or abscess, biliary or anastomotic strictures, biliary cirrhosis, and cholangitis). [15]

In this research, injury of the aberrant right hepatic duct (Strasberg type C) recognized during the intraoperative period; the researcher directly performed ligation to the duct and placement an intraabdominalsubhepatic drain. While if the same injury identified in the postoperative period, researcher performed percutaneous biliary drainage. Moreover, transection injury related to the common hepatic duct (Strasberg type E2) designated during intraoperative, researcher performed Roux en Y hepaticojejunostomy used an open procedure. Then, oblique injury about the common hepatic duct (Strasberg type D) identified in the postoperative period, researcher sutured the duct and drainage of bile with T-tube placement.

PREVENTION

Prevention of iatrogenic injuries to the bile ducts during laparoscopic cholecystectomy relied on (i) through an understanding of the anatomy, risk factors and the mechanisms of injury, (ii) image interpretation skills; (iii) meticulous technique and (iv) timely decision for elective conversion in the presence of difficult anatomy. Epidemiologists classified prevention of health problems into primary and secondary[16] such as:

Primary prevention

In the case of LC, primary prevention was protecting patients from bile duct injury. In preoperative, protection cares was surgeon training and patient selection. Of the preoperative tests, only gallbladder wall thickness >7 mm on ultrasound scan accurately used to predict the difficulty of the operation such as lengthen the duration of the procedure. However, there were no reliable preoperative indicators to determine the risk of biliary and vascular injuries during LC. Prevention care for these complications, therefore, depended on the adoption of correct surgical technique and a low threshold for conversion. Since the major direct causes of biliary injury such as misidentification of anatomy and technical errors were recognized, safety entirely depended on a complete visualization, display and structures identification of triangle of Calot.

Consequently, the 30° laparoscope provided a better view of the anatomy, especially for common bile duct. The technique had to be standardized with adequate lateral and inferior retraction of Hartmann's pouch (infundibulum) to separate a cystic duct from the common bile duct.

The dissection should commence high on the neck of the gallbladder. The correct technique of clip application was necessary. The majority of the surgeon used clips to secure the medial end of the cystic duct, and only minority surgeon used ligation this duct. During the detachment of gallbladder from its hepatic bed, the dissection should be kept close to the gallbladder and above the fascial covering of the gallbladder bed. This maneuver functioned to avoid both bleedings from the hepatic parenchyma and injury of segmental ducts in segment IV, V of the hepatic.

Secondary prevention: an. early detection

The consequence of bile duct injury could be reduced by early recognition of the injury and optimal repair. If the injury was discovered during operation, the outcome was better than the injury was discovered late. Only one-third of bile duct injuries sustained during LC were detected at the primary operation, then majority cases (60%-80%) were found at an average of 10 postoperative days. Early recognition of the injury could be achieved by investigating the source of any biliary leakage observed during the operation, the use of intraoperative cholangiography, and possibly intraoperative (completion) ultrasonography. The use of intraoperative fluorocholangiography (IOFC) during cholecystectomy had been controversial since recommended by Mirizzi in 1937. Some surgeons used it routinely, others were selectively or not at all. Proponents of the routine use argued IOFC delineated biliary anatomy and provided a 'road map' of the entire biliary tree. Failure describing the whole extra and intrahepatic biliary tract patient with Trendlenberg position was an indication for conversion. Routine IOFC ensured familiarity with the technique and its interpretation so that the procedure was carried out expeditiously well inside 10 minutes. A previous prospective study performed the method to determine the frequency and type of bile duct abnormalities, and to determine the efficacy of routine IOFC during LC in the prevention of bile duct injuries, shown anatomical biliary abnormalities in 98 of 513 cholangiograms (19%). If damage to the biliary tracts occurs early during

operation, the cholangiogram allowed the surgeon to detect the injury, then made a prompt repair and thereby reduced morbidity associated with a delayed diagnosis.

CONCLUSION

Laparoscopic cholecystectomy becomes the prompt treatment for symptomatic cholelithiasis, and it was associated with an increase of incidence of bile duct injury. Despite increasing awareness of this problem, yet more attention should be paid both in prevention and early recognition of such injury. Long-term follow-up was required.

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Participatory Approaches in Creating a Concept of Healthy Public Transport Facilities Toward Healthy Community

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ABSTRACT

The demand for public transport in developing countries nowadays is very high. Ironically, most of the public transport facilities including transit facilities in developing countries are often inconvenient, uncomfortable, and dangerous. Therefore, a proper guidance in developing public transport facilities is urgently needed. The study aimed to create a new concept of healthy passenger station based on stakeholder ideas and participation.

The study applied mixed methods with a sequential exploratory approach which used qualitative and quantitative approach respectively. The study consists of 3 phases; exploring the stakeholder's perceptions, forming a new concept of the healthy station, and applying the new concept. The healthy station must meet two main indicators; environmental indicators and social indicators. The concept consists of 4 classifications of the healthy station; Paripurna, Mandiri, Madya, and Pratama, respectively from the best to the worst condition.

Keywords: *Healthy Station, Healthy Setting, Healthy Concept, Transport, Healthy Community*

INTRODUCTION

The rapid growth of population demands the sufficient transport systems and facilities. The demand for public transport in developing countries nowadays is very high. The majority of inhabitants still prefer to use road based transport such as buses, taxies, and passenger cars to get their destination. Ironically, public transport facilities including transit facilities and station in developing countries are commonly inconvenient, uncomfortable, and dangerous. This fact currently brings the developing countries into serious issues in transportation system including air pollution, accidents, environmental damage, and lack of accessibility.[1]

In developing facilities, many aspects must be considered including economy, health, environment, and social. In 1987, World Health Organization (WHO) launched a program called "Healthy City" which emphasized in healthy setting.[2,3] WHO describes the healthy setting as "*Health is created and lived by people within the settings of their everyday life; where they learn, work, play, and love* (Ottawa Charter, 1986). Healthy setting aims to maximize the prevention efforts with holistic approaches (whole system). This system is very important to boost a holistic approach model of health.[4] The healthy setting pays more attention to determinant factors of health-related to daily life of society.[5] The healthy setting can also be defined as the arrangement of places or social context where people do their daily activities in which environment, organization, and individual factors interact to influence people health and prosperity.[6]

Healthy setting concept purely appeared from the concept of the important role of local government in shaping and developing public health condition.[7] The setting approach requires four principles including participation, equivalence, partnership, and sustainability and the healthy setting is characterized by three related

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dimensions; public health ecology model, perspective system, and whole system focus.[4] The healthy setting must be applied in all sectors including transportation system because it plays an important role in creating healthy community.

Numbers of studies showed the impact of transport system facilities to both human health and environmental quality. Good public transport facility can attract the society to take public transports which increase their physical activities and reduce air pollution from their private cars. Therefore, the study aimed to find or create a new integrated concept in developing good public transport facilities based on stakeholders' ideas and perceptions. The transport facility in the study focuses on passenger station or transit facilities as an important part of the transport system.

METHOD

The study applied mixed methods with a sequential exploratory approach which used qualitative and quantitative approach respectively. The study consists of 3 phases; exploring the stakeholder's perceptions, forming a new concept of the healthy station, and applying the new formed concept. The data was collected trough observation, in-depth interview, focus group discussion (FGD), and the study tested the new concept in 24 stations in South Sulawesi. The data collection started from December 2016 to September 2017. The participants of the study came from different backgrounds including governmental sectors, Non Governmental Organizations, users/ passengers of the stations; and sellers. The qualitative data was analyzed by using software called "NVIVO" and the quantitative data were analyzed using statistical software "SPSS".

RESULT

Phase 1

The stakeholders or the participants of the study agreed that the healthy passenger station must meet two main indicators; environment (environmental design) and social. Environmental aspects including the availability of the smoking room, nursery room, disable support facility, vehicle check-up service, health service/ onsite clinic facility, good sanitation, and the existing of green spaces/ park. Social indicators cover safety and comfort. Both indicators aim to create healthy, comfort, and safe terminal for users, workers, and communities. Good environmental structure of the station indirectly shapes good social condition.

Phase 2

The study set an observational questioner of 70 questions as a tool and instrument in evaluating the existing stations whether the station is a healthy station or unhealthy station. The questioner is based on the indicators of the healthy station which was created in phase 1. The questioner used the Likert scale. There are 3 answers; a, b, and c. The answer is worth 3 for a, 2 for b, and 1 for c.

Number of questions : 70

The highest score : 70x3= 210

The lowest score : 70x1= 70

The highest percentage : 210/210 x 100%= 100%

The lowest percentage : 70/210 x 100% = 33.3%

The average 100-33.3%= 66.7%

The study then created 4 categories of the healthy station; Paripurna, Mandiri, Madya, and Pratama, respectively from the highest score to the lowest score based on the range of their value from the questioner. The higher score is the healthier terminal.

$$\text{Scale Range} = \frac{\text{The averge}}{4} = \frac{66.7\%}{4} = 16.67$$

a) Paripurna = 100-16.67
= 83.32
>83.32 is classified as Paripurna terminal (the best terminal) (Class 1)

b) Mandiri = 83.32-16.67
= 66.65
66.65- 83.32 is classified as Mandiri terminal (Class 2)

c) Madya = 66.65-16.67
= 49.98
49.98-66.64 is classified as Madya terminal (Class 3)

d) Pratama = 49.98-16.67
= 33.31
33.31-49.97 is classified as Pratama terminal (Class 4)

Phase 3

From 24 stations evaluated in South Sulawesi, there are only 5 Madya terminals (Class 3) and 7 Pratama terminals (Class 4), while the rest of the stations are uncategorized table 1 reveals that the stations in South Sulawesi are in poor condition.

Table 1. The result of measurement and evaluation of the passenger stations in South Sulawesi, Indonesia

Class	Number	Percentage (%)
Paripurna	0	0
Mandiri	0	0
Madya	5	20,8
Pratama	7	29,2
Uncategorized	12	50

DISCUSSION

Environmental Indicators

Supporting facilities for people with disabilities

A good station must be accessible and friendly for all including the person with a disability. The right of people with disability has been protected and recognized internationally through "Convention on the rights of persons with disabilities" conducted by United Nations. The convention addressed all issues related to disabled including communication, discrimination, reasonable accommodation, and universal design.[9] Indonesia has also put disability issues as a serious concern by passing the Law of the Republic Indonesia No. 8 in 2016 on Disability. Good transportation system allows people with disabilities to be more active, explore their self-potential, and advanced their personal skills. A study literature of the relationship between health and employment conducted by Ellie showed that productive and active people (working people) have better functional status and better self-related health; the study also reviewed the links between employment and health among people with disabilities which revealed that of the 47.377 adults (25 to 64 of ages) with disabilities across the United States who work had less frequent mental health (18%0 than those did not work (40%).[10] The high number of unemployment among person with disabilities are caused by many factors including lack of universal access in the structural building, lack of special need facilities such as accessible toilets and wheelchair pathway.[11,12]

Nursery room

Exclusive breastfeeding is very important and highly recommended for a mother. Exclusive breastfeeding is that the infant only receives breast milk without any additional food or drink for the first 6 months of baby age.[13] A study conducted by Cesar and team showed that infants exclusively breastfeed have only 12% risk of death compared those without breastfeeding.[14] Breast milk is the best food for the infants and the strongest antibodies.[15] Supporting breastfeeding program means creating a bright future generation and healthy community. Therefore, all public facilities must provide comfortable, safe, and private rooms for the mother to breastfeed and look after their baby. According to the stakeholders, the availability of nursery room will attract passengers with a baby to take public transportation.

Smoking room

Smoking activity is always a hot debate between health and human right concerns. The smokers have right to smoke, on the other hand, all people have right to inhale fresh air without contamination from the smoking activity. To solve this problem, some countries take a pathway by providing smoking policy control such as establishing smoking room facilities in the public area. The smoking room allows the smokers to get their right to smoke and at the same time protect non-smokers from the exposure of effects of smoking.

Secondhand smoking has been known as very dangerous exposure. The Secondhand exposure is strongly linked to coronary heart disease, stroke, dementia, breast cancer, chronic respiratory illness, depression, and mental illness.[16] The concentration depends on the intensity of smoking, dilution by ventilation, and other processes removing smoke from the air. Moreover, the concentrations are highly determined by design and operation of a building.[17] Therefore, a specific room for smoking is needed to restrict the wider spread of contaminants from smoking.

Vehicle service facilities

According to WHO until may 2017, more than 1.25 million people die annually because of road traffic accidents. 90% fatalities on the road globally happen in low and middle-income countries. Between 20% and 50% million people suffer non-fatal injury but many of those sufferers experience disability. The risk factors of road accidents include human error, speeding, driving under the influence of alcohol and other psychoactive substances, nonuse of safety tools, distracted driving, unsafe road infrastructure, and unsafe vehicles.[18] However, vehicle condition factor can be prevented by providing regular check-up facility in the station. The

vehicle must regularly be checked up before starting the trip to reduce the potential incident in their operations.

Green Spaces

Station is an assembly point for the vehicles to stop and transit, to drop and pick up the passengers. There are high potential air pollutions from the vehicle combustion operating in the station. Air pollution can cause the inflammation of respiratory system, cardiovascular diseases, and reduce lung function.[19] According to Brauer et al. 89 percent of the population globally are exposed by air pollutants which exceeded the air quality guideline of World Health Organization. WHO estimated about 800.000 of early deaths caused by PM annually.[20] PM 2.5 is correlated with low birth weights, premature birth, and small for gestational age births, and ozone exposure was suspected to give negative effect to birth weight and neurodevelopment.[19] Moreover, a study in Canada found a strong correlation between chronic exposure to traffic-related air pollution (particularly NO2) and increasing the risk of ischemic heart diseases.[21]

Many studies had proved that the green spaces have positive effects on mental health. Beckerman et al (2012) reported positive outcomes of green spaces to mood, stress relief, concentration and memory, childhood development, and aggression. Green spaces also reduces anthropogenic noise buffering and production of natural sounds, improve pro-environmental behavior and improve sleep quality.[22]

Health service facilities and sanitation

Station is a very busy place every time; people come from and go to different areas. This condition can lead to the spread out of many diseases easily as well as traffic accidents. The stakeholders considered that the availability of health service facility in the station is very important to provide first aid service for people in the terminal. The medical service also can provide regular check up for long-distance drivers to check their health condition which can reduces traffic accidents. Development of a station also must ensure the availability of good sanitation facilities including proper waste management, toilets, drainage system, and clean water.

Social Indicators (Comfort and safety)

Public facilities must be comfortable and safe for all. The analysis showed that good environmental design makes the passengers comfortable in the stations. The comfort can depend on the availability of basic necessity such as toilets, free smoking area for smokers, nursery room for mothers with babies, green spaces for relaxing and waiting, free from odor, clean environments, and supporting facilities for person with disabilities. The security of the station is very important; everybody has to be convinced that they are secured during their time in the station. Security or safety includes no crime, safe food, safe environment, and no accidents.

The case study: The station in South Sulawesi, Indonesia

From 24 station evaluated in South Sulawesi, only 50% of the stations meet the categories formed in this study, and none of the station met the category of Paripurna (Class 1/ the best) and Mandiri (class 2). There were 7 Pratama stations and 5 Madya stations, while the value of the other 50 % of the stations had very low. Most of the stations did not have supporting facilities for person with disabilities, green spaces, health service facilities, vehicle check-up facilities, smoking room, and nursery area. There are two main factors causing this condition; 1) There is no specific guideline of the healthy station provided by the government and 2) The country has very limited resources to create a high-quality station.

CONCLUSION

The development of public facilities particularly station as part of transportation facilities must ensure that people are comfortable, convenient, and safe. The development is also required to pay attention to environmental condition. The stakeholders agreed that a station must ensure that all people get their right during their time in the station. Person with disabilities can travel easily, smokers can get their right to smoke without harming non-smoker, and children get their right to be feed by breast milk in the station. Moreover, the station also needs to provide health service facilities, vehicle service facilities, sanitation facilities, and green spaces.

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Meeting the Unmet Need with a Fit Model for Contraception Mix

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ABSTRACT

The broadening of access for equipment and service availability is the key in increasing the scope of family planning and reproductory health. Through the estimation of fit mix model of contraception will help the supply of contraception to meet the society's needs. This study aims to estimate a fit model for contraception mix for the five provinces in Java Island. The data used were SDKI (IDHS) data in 2003, 2007, and 2012. The method used to formulate the fit contraception model was calculating the number of fertile women according to the phases of reproduction and number of children. Then, the formulation of appropriate method was conducted following the contraception guidance from *Pendewasaan Usia Perkawinan* (PUP), a program aiming to raise the age of marriage. The results of the study show that on average, the main needs for contraception in the society are the surgery method for females and the contraception method for males. This finding differs significantly from the common practice of contraception mix that generally is skewed towards the injection method. To provide contraception that not only fits the stages and the public's needs but also broaden the society's knowledge, it is expected that the society use appropriate contraception as this will increase the success rate of the decline in fertility and the increase of reproductory health.

Keywords : *family planning, mix method, contraception supply.*

INTRODUCTION

The total Fertility Rate in the world ranges from 0.8 in Singapore up to 6.89 in Nigeria[1]. In this list, Indonesia is on the 102th position with a TFR of 2.6 in 2012[2] and an excess of as many as 3.4 million in the number of its total population in 2010 compared to the projected number[3].

Java as the most populous island in Indonesia requires more attention in the field of family planning. The Government, in this regard BKKBN, experiences problems in the family planning program management with a stagnation of TFR occured at a figure of 2.6 in 2003-2012[4].

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One factor that can maintain the decline in fertility is the selection of methods offered to the community. The choice of the given method is mainly offered in rural or remote areas where access to health facilities is difficult. This is similar to research conducted by Magadi and Curtis that the preferences, needs and beliefs related to contraception vary widely in the community. Study of Magadi and Curtis yielded the conclusion that family planning programs have to be able to accommodate the various needs of contraception users[5].

Increased access to a wider service including long term contraceptive can decrease the failure of contraception and unintended pregnancy especially in areas that have restricted access[6]. Research conducted by Bongaarts & Johansson predict that when service quality is increased and the market for contraceptives as well as wider knowledge and education related contraception increases then the types and the balance of the contraceptive used among existing contraceptive method will be achieved[7].

Previous research shows an increase in the availability of contraceptive methods will help acceptors to choose a method that suits their reproductive goals, either the aim is to delay, space out, limit or stop the birth/having children[8]. The selection of the method of contraception is the key element of family planning services because it represents the right to reproduce[9].

The skewness of mix contraceptives in Indonesia led to the hormonal method, especially injection, have occurred since the year 2003[10]. When the skewness is purely due to the preference of the acceptors then there would be a problem. But investigation results show that this is the effect of various conditions such as lack of knowledge of related methods that are used as acceptors[11]. In additon, the limited access also forces the acceptors to choose methods that are available and most affordable.

Increased access to a wider service including long term contraceptive can decrease the failure of contraception and unintended pregnancy especially in areas that have restricted access[12]. A high concentration on one or more particular types of contraception is a sign of the availability of existing methods in the society is unequal[13]. The Government and local authorities in implementing a mandatory family planning provide the infrastructure and facilities required.

During this time the supply of contraceptives in Indonesia have not adapted to the integrity of the ideal community yet. The study aims to formulate a fit model for the contraceptive mix based on age and number of children in five provinces in Java Island. The model obtained can be the benchmark for the supply of contraceptives in Java. With proper supply of contraceptives it is expected that the society can use contraceptives in accordance with their needs.

MATERIAL AND METHOD

This study uses secondary data from Indonesia Demographic and Health Surveys in 2003, 2007 and 2012 to see the dynamic mix of contraceptives. The fit model of contraceptive mix is formulated from data analysis of the year 2012. Samples taken are all married women aged 15-49 years. Respondents selected were then grouped in accordance with the range of reproductive age as follows:

Table 1: Respondent Group According of Age

GROUP	AGE
Group 1	15-19 years old
Group 2	20-35 years old
Group 3	36-49 years old

Respondents in each group were then categorized according to the number of children

Table 2: Respondent Categorize

GROUP	TOTAL OF CHILDREN
Group A	0 – 2 children
Group C	3 or more children

The next stage is formulating a recommended contraceptive in accordance with the raise of the age of marriage with the following details:

15-19: married women aged 15-19 years are categorized into the stage of delaying. The recommended contraceptive method is kondom, oral and pills[14].

20-35: this is a period of gestation. Empirically age range 20-35 is the best time to get pregnant and give birth to a child. In principle all methods of childbirth can be used at this age except. In the PUP (*Pendewasaan Usia Perkawinan*) guide after the birth of the first child it is recommended to use IUD right away[14]. At this age the method of discharging MOW/MOP after having 3 or more children can also be chosen;

The age of over 35: this is the period to prevent pregnancy. The main contraceptive recommended for PUP age 35 years and above is MOW/MOP and the other option is the IUD to those who have 1-2 children[14].

RESULTS

Analysis of methods of contraception are conducted on six provinces in Java island namely Jakarta, West Java, Central Java, Yogyakarta, East Java, and Banten. In 2003 contraceptive mixes in some provinces began to show skewness towards certain methods. West Java, Central Java and Banten province experienced skewness towards injection method. DKI Jakarta, Yogyakarta and East Java have not experienced skewness.

Table 3: Contraceptive Mix in Java Island in the Year 2003

Province	Pill	IUD	Injection	Condom	Female Sterilization	Male Sterilization	Norplant	TOTAL
DKI Jakarta	21,79	17,36	47,24	5,34	5,63	0,13	2,51	100
West Java	27,37	6,41	56,31	0,73	4,48	1,7	2,99	100
Central Java	14	9,98	51,99	1,88	8,63	1,22	11,64	100
Yogyakarta	12,03	30,77	35,89	5,59	9,92	0,59	4,99	100
East Java	20,81	17,49	42,12	1,23	9,46	0,25	8,37	100
Banten	19,04	8,6	60,8	1,89	3,04	1,55	4,87	100

Data from 2007 showed that skewed contraceptive mix was injection method in Central Java, West Java, East Java, and Banten provinces. The province with the most balanced contraceptive mix is the province of Yogyakarta.

Table 4: Contraceptive Mix in Java Island in the Year 2007

Province	Pill	IUD	Injection	Condom	Female Sterilization	Male Sterilization	Norplant	TOTAL
DKI Jakarta	24,36	11,67	48,03	6,27	4,74	0,62	3,82	100
West Java	32,15	8,72	51,15	2,6	2,55	0,69	2,13	100
Central Java	14,39	6,6	62,56	2,64	8,62	0,94	4,25	100
Yogyakarta	12,26	25,76	39,49	11,91	6,4	0,35	3,59	100
East Java	19,35	12,62	53,85	0,85	6,57	0,05	6,67	100
Banten	17,83	8,04	64,55	1,22	5,17	0,54	2,65	100

Data from 2012 show that contraception mix that experienced skewness was injection method in Central Java, West Java, East Java and Banten provinces. The province with a relatively balanced contraception mix was Yogyakarta.

Table 5: Contraceptive Mix in Java Island in the Year 2012

Province	Pill	IUD	Injection	Condom	Female Sterilization	Male Sterilization	Norplant	TOTAL
DKI Jakarta	24,05	12,03	48,87	5,1	7,23	0	2,56	100
West Java	27,61	6,93	55,15	2,51	5,26	0,09	2,34	100
Central Java	16,38	6,05	54,88	4,74	7,79	0,65	9,41	100
Yogyakarta	17,13	22,93	37,46	9,06	6,81	0	6,44	100
East Java	23,33	8,38	55,25	2,04	5,72	0,41	4,86	100
Banten	21,22	5,67	62,14	3,98	3,82	0,1	3,06	100

Hormonal contraceptive methods such as pills and injecting relatively dominant when compared to other methods. In the year 2003, skewness started to show towards the injection method. Skewness occured until the year 2012. The province of East Java in 2003 has not experienced skewness, but in 2007 up to 2012 there was a skewness

towards injection methods. The proportion of contraceptive methods in DKI Jakarta and Yogyakarta was relatively stable from 2003 until the year 2012 and did not experience skewness.

Distribution of fertile women age and number of children in each province showed a relatively similar trend. Women aged 15-19 years were married in all provincial on average do not have children or have 1 or 2 children.

Women aged 20-35 years on average have yet to have children or have up to 2 children. Only a small percentage of the respondents have more than 2 children.

Table 6: Distribution of Age and Number of Children in each Province

Provinsi	Usia/ Jumlah Anak						TOTAL
	15-19		20-34		>35		
	0-2	>3	0-2	>3	0-2	>3	
DKI Jakarta	347		1044	58	547	395	2391
West Java	338		863	78	449	496	2224
Central Java	303		786	34	523	352	1998
Yogyakarta	218		587	25	498	191	1519
East Java	251		810	51	557	310	1979
Banten	343		867	95	313	450	2068

The result of the respondent's calculation according to the age stages and the number of children is then calculated according to the appropriate contraception. The fit model for contraceptive mix obtained Yogyakarta province has the highest requirement in MOW / MOP method 29,78% then IUD, implant, injection, pill, and condom. East Java Province has the highest requirement of IUD method 35,59%, then MOW / MOP, implant, suntil, pill, and condom. Banten Province has the highest need in MOW / MOP method, IUD, injection, pill, implant, and condom.

Table 7: Fit Model of Contraceptive Mix in each Province According to Age and Number of Children

Provinsi	Pil	IUD	Suntik	Kondom	MOW/ MOP	Susuk
DKI Jakarta	15,74	23,56	15,74	4,83	29,17	10,91
West Java	10,14	22,75	10,14	5,07	34,14	9,70
Central Java	10,12	23,77	10,12	5,06	31,56	9,83
Yogyakarta	9,56	26,87	9,56	4,78	29,78	9,66
East Java	8,46	35,59	8,46	4,23	31,02	10,23
Banten	11,06	20,35	11,06	5,53	31,63	10,48

DISCUSSION

The contraceptive mix is the proportion of contraceptive methods in society. This proportion illustrates the choice of existing methods in society. The misuse of the proportion of contraceptive use (method mix) is the condition of 50% or more of contraceptive users in a country using similar contraceptive devices[15]. In Java, skeweness from 2003 to 2012 changed

significantly. In 2003 skeweness started to show towards the injection method, the skew happened until 2012.

The shift in contraceptive mix is very important for governments, donor countries (donors) and researchers who study the dynamics of contraception[16]. Skeweness can be influenced by a variety of factors. Some are influence by sexual funtion perception, even research found there is no correlation between oral contraception with sexual function[17]. Another study conducted by Schoemaker in Indonesia mentioned to understand the reason women choose contraceptive methods can be seen from the desire to limit the number of children[18].

The fit model for contraceptive mix model obtained in Jakarta Province shows that MOW/MOP method should be the highest priority with 29,17% requirement followed by IUD, injection method, pill, implant, and condom. West Java Province has the highest requirement in MOW / MOP method (34.14%) then IUD, injection method, pill, implant and condom. Central Java Province has the highest requirement of MOW / MOP (31,56%) then IUD (23,77%), injection and pill (10,12%) implantation (9,83%) and condom (5.0,0%).

Yogyakarta province has the highest requirement in MOW / MOP method 29,78% then IUD, implant, injection, pill, and condom. East Java Province has the highest requirement of IUD method 35,59%, then MOW / MOP, implant, suntil, pill, and condom. Banten Province has the highest need in MOW / MOP method, IUD, injection, pill, implant, and condom.

The difference between existing conditions and ideal contraceptive mix has some possibilities:

1. The first possibility is the lack of public knowledge in determining appropriate methods of contraception. Lack of community knowledge related to appropriate reproductive and contraceptive stages is caused by inadequate information from provider, formal knowledge or health promotion from the government.

2. A second possibility is inadequate access and services both in scope and in conformity with needs.

Providing appropriate contraceptive services to the needs and purposes of reproduction will have a major positive impact. If all women who want to avoid pregnancy get contraceptives according to their goals as well as all pregnant women and newborns get WHO standard health care, it is predictable that the number of unwanted pregnancies will fall by 70%, the maternal mortality rate will drop by 67% the newborn's mortality rate will drop 77% and HIV-to-AIDS transmission from mother to newborn can be reduced to 93%[19].

The fit model of mix contraceptive mix from this research can be used as a parameter to the provision of contraceptives in six Provinces on Java island. Supplies of the contraceptive method that corresponds to the needs that have been adapted to the stages of the reproduction and the number of children and supported by an increase in the knowledge society is expected to increase the scope and success of the family planning program, lowering unmeet need numbers and supporting the community in meeting their reproduction rights.

CONCLUSIONS

Mix contraceptives in four provinces in Java island experience deviation towards the injection method. The fit model of mix contraceptive obtained differs significantly from the real conditions. It reflects that the public has yet to get a contraceptive and family planning services according to their needs. The Government should take real steps in order to meet contraceptive needs of society. Some ways to achieve this are as follows:

Increasing public knowledge by means of socialization and promotion in the field so that people can identify family planning with the right contraception needed;

The provision of contraceptives in accordance with the needs of the community;

Revitalizing family planning program especially in remote areas with difficult access to healthcare facilities.

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Conflict of Interest: Nil

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The Analysis of Safety Culture of Welders at Shipyard

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ABTRACT

Welding have several potential to cause work accidents. Therefore, it is necessary to prevent work accident, one of them through safety culture. Safety culture is made up of three factors: psychological factors, job factors, and situational factors. The purpose of this study is to analyze safety culture based on the factors of safety culture in welders in shipyard company. This research was an observational research using cross-sectional design. The variables were safety climate, safety behavior, and safety culture. The results showed that most respondents had a very good perception of OSH and the safety climate profile was in a good category, most respondents had good safety behavior and safety behavior profile was in a good category. In addition, most respondents had a very good safety culture and profile of safety culture was 74,89% and in a good category. Based on these results, it is expected to develop the safety culture and make some efforts to improve the safety behavior of welder. The management of this shipyard company may take action to perform an analysis of safety culture level as a form of oversight of the existing safety culture.

Keywords: *safety culture, safety climate, safety behavior, welder, shipyard*

INTRODUCTION

Work accident is an unexpected incident that can cause loss, both of direct loss and indirect loss that affect workers, property, and production process[1]. Work accident can happen in entire work, include welding. Welding has several hazards including light hazard, smoke and welding gas, noise, heat, electric current hazard, fire hazard, and explosion hazard that can cause work accidents[4]. A Study have reported that welding is ranked second as work that can be causing workers to have eye injuries[2]. Also, every year there are 100 welding workers injured during welding process, which are 25 of them suffered serious injuries[3]

Therefore, it is necessary an effort to prevent the work accident, one of them is through safety culture[5]. Safety culture is included in a sub-component of an organizational culture that directly related to individuals, job, and organizations that have a role and influence in safety and health[6]. Safety culture is formed by 3 factors: psychology or individuals factor is measured by safety climate (perception), job factor is measured safety behavior observations, and situational factor is measured by the audit or inspection of safety management system[7]

The purpose of this study is to analyze safety culture based on the factors of safety culture, so it can be done the development of safety culture as an approaching form of work accident prevention on welders during work up to retirement and can improve the performance of welding workers in work.

MATERIAL AND METHOD

This research was an observational research using cross-sectional design. Research location was in the Division of Warship in a shipyard company. Participants were 58 welders. The variables studied were safety climate, safety behavior, and safety culture. Safety climate was used the Nordic Occupational Safety Climate Questionnaire (NOSACQ-50), safety culture was measured by questionnaire from the Workcover

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New South Wales, and safety behavior was observed for 15-20 minutes in each worker twice for 2 days. Besides that, the safety management audit result data was obtained from audit results conducted by the company. All of the questionnaires were calculated by the validity and reliability test.

FINDINGS

Safety Climate Factor of Welders

Table 1. The Frequency Distribution of Respondent's Safety Climate

Variable	Category	Percentage (%)
Safety Climate	Very good	29.3
	Good	25.9
	Poor	17.2
	Very Poor	27.6

Table 1 shows that most of the respondent has a very good perception of OSH as many as 29.3%. The percentage of the safety climate is:

The percentage shows that the safety climate profile is in a good category.

Safety Behavior Factor of Welders

Table 2: The Frequency Distribution of Respondent's Safety Behavior

Variable	Category	Percentage (%)
Safety Behavior	Good	41.4
	Enough	25.9
	Poor	32.8

Table 2 presents that most of the respondents have a good safety behavior as many as 41.4%. The percentage of the safety climate is:

The percentage shows that the safety behavior profile is in a good category.

Safety Culture of Welders

Table 3: The Frequency Distribution of Respondent's Safety Culture

Variable	Category	Percentage (%)
Safety Culture	Very good	53.4
	Good	46.6

Table 3 explains that most of the respondents have a very good safety culture on aspects of training and supervision, safe working procedures, consultation and communication, safety reporting, management commitment, injury management and return to work.

Table 4: The Safety Culture Profile

Factors	Percentage (%)	Safety Culture Profile
Safety Climate	75%	74.89%
Safety Behavior	64.14%	
Audit of OSH Management	85.54%	

Based on the percentage of safety climate (75%), safety behavior (64.14%), and audit result of OSH management system (85,5%), the average score of safety culture is 74,89%. Table 4 reveals that safety culture profiles at a good level.

DISCUSSION

Safety Climate of Welders

Safety climate is an individual factor in safety culture. Safety climate was the worker's perception of occupational safety and health in the workplace[9]. Based on the research results obtained that most of the respondents have a good safety climate. This indicates that the respondents have a good perception related to occupational safety and health in workplace, particularly related to safety management priorities, commitment and competencies, management authority on safety, equity management in safety, workers commitment to safety, safety workers priorities and risk-taking, learning, safety communication, and trust in competence, workers believe in the ability of the safety system.

Based on interviews, most of the respondents considered that everything that management do related to OSH aims to avoid the work accidents and to protect workers from hazards potential during the welding process. This indicates that respondents have positive responses to the OSH efforts conducted by the management. The safety climate indicated a real cultural indication in the organization[10]. The current study found that creating an appropriate and positive safety climate would further motivate workers to pay more attention to activities related to occupational safety and health compared with the negative safety climate[11].The perception was a dynamic and changeable thing[6]. So that one's view would change if the environment changes[12]. Therefore, the management should create possible conditions that enable the perception of workers to be better so that OSH program could be effective in the implementation.

One of the efforts that can be done to create a positive safety climate is to create a good and complete OSH management system. This is caused by safety climate gave a subjective assessment of various safety characteristics, while the safety management system tends to provide objective evidence[7]. This shows that safety climate and safety management system complete each other. Besides that, changes in the safety management system would effect to the worker's perception[6]. Therefore, the management should create and maintain a good safety management system. Safety management system was a system used to manage all aspects of OSH in the company[13]. Implementation of OSH management is an absolute thing to be done because the government has obliged this through legislation. This company has implemented OSH management well. This was proved by the result of OSH management audit that shows the achievement with a percentage of 85,54%. This result proved that entire levels of workers in this company were committed and support the implementation of OSH in the workplace.

Safety Behavior of Welders

Safety behavior is job factors in safety culture. Safety behavior which was the focus of this research was the use of the correct PPE and appropriate with the procedure in the welding process. Welding process had several hazard potential that was health and safety hazards. Health hazard obtained from welding gas, noise, vibration, and ergonomic, while safety hazards consist of fire and explosion, lack of oxygen in confined spaces, electricity, slipping and falling[14].

The potential hazards of the welding process could be minimized by using PPE. Personal Protective Equipment (PPE) is one tool that had the ability to protect someone which function was to isolate part or whole body from potential hazards in the workplace.The PPE used in welding process appropriate to the prevailing standard procedure in the Division of Warship are helmets, work clothes or coverall, stiwel or foot protector, safety shoes, long leather gloves, leather apron, hand/head cap, head sheat, welding respirator, hand sheat, and ear plug.

The result of the research shows that most of the respondents have good enough safety behavior in the use of PPE. The most commonly used PPE by respondents are helmets, work clothes, safety shoes, long leather gloves, leather apron, hand/head cap, welding respirator, and hand cover. However, there is still PPE that is rarely used by the respondents such as earplug, stiwel, and leather apron. A small percentage of respondents rarely use earplug because they feel disturbed and uncomfortable. The respondents also rarely use stiwel because they feel enough use work clothes and safety shoes. While leather apron is used in certain working position and the management does not provide leather apron in accordance with the number of workers due to economic reason. Helmets are rarely used during the welding process because the head cap form is not possible to use a helmet, so the helmet is used except that work or after finish the welding process. Besides that, some PPE also used imperfectly, for example, the head sheat is not buttoned so that it still has the potential to be exposed by fire sparks, not using black glass that can cause visual disorder due to welding light, and not be hooking the helmet.

Based on the observation, respondents realize are aware of the importance of using PPE for example immediately replace the filter mask if it is dirty or unfit for use and replace the gloves if there is a hole or tear. While research, filter mask for welding runs out so that the workers use two fabric masks inserted into the mask as a replacement. This indicates that workers are aware and willing to perform safety behavior, but the availability of PPE facilities is still awaiting purchase and distribution.

Safety Culture of Welders

Safety culture was the value of individuals and groups, perceptions, attitudes, competencies, and behaviors that can determine the running of OSH management system in company[15]. In addition, safety culture was the impact of the organization that influenced attitudes and workers behavior associated with risks at work[10]. The results show that most of the respondents have a very good safety culture related to the six aspects of safety culture. The six aspects are training and supervision, safe working procedures, consultation and communication, safety reporting, management commitment, injury management and *return to work*.

The six aspects show that respondents judge everything done by the management to improve OSH at work has been very good. Based on them, it can be concluded that safety culture is good or strong. The literature said that management's behavior in strong safety culture could be seen in all decision taken considering related risk aspect, safety became the main part from company tried to understand the risks that could arise and the solution that can be given, provided appropriate resources with job risks, able to learned from experience of OSH problems faced, and made efforts to improve the poor performance of OSH[12].

In addition to the six aspects described above, safety culture was sub-component from the organizational culture that was an interaction from safety climate, safety behavior, and audit of OSH management system[7]. Based on the percentage of these three aspects obtained the safety culture profile in a good category in the Division of Warship. Safety culture in a good category was a positive safety culture. The reference said that characteristics of positive safety culture are open communication and feedback on suggestions and inputs to all levels in organization, all workers focused on all things that could prevent work accident to happen as well as the disease because of work, there is commitment of entire workers and the management in following all the rules and the process to created an healthy and safety work environment, prioritizing safety factors from all factors that could affect the performance of the company, and all workers were appreciated and protected[16].

Safety culture in the good category also indicates that the scope of each forming factor is good and integrated. This indicates that each of these factors interconnects and interacts with each other. These findings were in line with the previous study that there was an interrelationship between safety climate and safety behavior, safety behavior and OSH management system, and safety climate and OSH management system[7]. These result also further support the idea that safety culture was formed from a set of components of belief, motivation, personality skills, and intelligence, behavior, and environment[10].

Besides that, safety culture is a concept that involved the human aspect that had internal aspects that were not visible (mind/perception) and observable external aspects (behaviors) that are within a social context (organization)[16]. *Business Process Model of Safety Culture* indicated that safety climate, safety behavior, and OSH management system were combinations of inputs in the process of establishing a safety culture[8]. Therefore, this three factors can't stand alone, so the representation of the safety culture should involve this three factors and not only use one indicator from one of that factors.

Although the safety culture results have shown the good results, still needed efforts to develop the safety culture. Culture concept, in general, is adaptive that could change according to human needs[17]. Based on this, it can be concluded that safety culture can be developed, formed, or created in accordance with the goals and characteristics of the company. According to the previous study said that in the development of safety culture needed to pay attention to several things that the measurement of safety behavior, observation of worker's readiness, observation of work environment condition, and management commitment[18]. Besides that, development is done by various ways, for example through the leadership approach, Behavioral Based Safety (BBS) program, integration of OSH management system, improves supervision and etc[16]. Also, it is necessary to analyze the power of OSH culture aimed at understanding the shifting mindset and behavior from time to time, so that the safety culture can develop well and mature.

CONCLUSION

This study has shown that the safety culture of welders in shipyard company was excellent and the percentage of safety culture profile is in a good category it means that all forming factors of safety culture that are individual factors, job factors, and situational factors interconnected and interact with each other.

The management of this shipyard company may take action to perform a level of analysis or a safety culture ladder as a form of oversight of the existing safety culture. This study was not possible to assess safety climate, safety behavior, and safety culture at each level of workers. So, further research needs to measure them at each level of workers to get more varied results and can be compared with others, so that can be determined the best solution in developing the safety culture in the future.

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The Mediation Effect of Emotional Labor between Customer Orientation and Posttraumatic Growth

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ABSTRACT

Purpose: This study aimed to identify the mediating effect of emotional labor in the relationship between customer orientation and posttraumatic growth among Korean emergency nurses. Method: A cross-sectional study design was used. Participants were 135 registered nurses working in the emergency room of four tertiary hospitals in Korea. Data were collected through convenience sampling using self-reported questionnaires. Data were analyzed using hierarchical regression and Sobel test. Results: Customer orientation was positively associated with posttraumatic growth and emotional modulation efforts in profession. Emotional modulation efforts mediated the relationship between customer orientation and posttraumatic growth. Conclusion: The findings provide evidence for emotional modulation efforts in profession as a factor that buffer effects of customer orientation on posttraumatic growth.

Keywords: *Customer orientation, Emotional labor, Growth, Nurse, Trauma*

INTRODUCTION

Customer orientation means that a service provider performs all offering actions according to customers' needs and requests.[1] In an organization where jobs are done in face-to-face activities, customer orientation is classified as a critical organizational management strategy because it enables organizations to achieve their goals effectively, by identifying customer needs and achieving customer satisfaction.[2] This trend is expanded to the medical circle so that customer orientation is emphasized in hospitals.[3] According to the previous studies, customer orientation influences productivity of hospital and an qualitative improvement in nursing service[4], and effectively reduces patients' psychological anxiety.[5] Therefore, nurses' customer orientation is of very importance in terms of hospital's competitiveness security and an qualitative improvement in nursing service

Nurses in emergency departments tend to work hasty in order to prepare for an urgent situation so that they have difficulty listening to and sharing the requests and problems of patients or their caregivers.[6] Moreover, they are exposed to verbal violence of patients or their caregivers.[7] In this circumstance, nurses suppress their feelings or experience emotional labor, their effort to overcome a situation on the basis of their vocation as nurse.[8]

Nurses' emotional labor works as the predisposing factor of job burnout and turnover intention, and produces negative effects like their lowering intention to keep the current nursing job, and therefore, it is classified as the concept requiring intervention.[9,10,11] Most studies on nurses' emotional labor made use of the tool modified on the basis of the tool developed for hotel employees[9]. Since the sub factors of the tool are the frequency of emotional labor, a level of attention by emotional display norm, and emotional dissonance[12], there is a limitation in measuring the attributes of nurses' emotional labor accurately. Hong reported nurses' emotional labor by two attributes, which one is nurses' effort to feel their actual emotion to express and the other is their effort to express the emotion inconsistent with their actual emotion.[8] Nursing with their hiding an actual emotion lowers job satisfaction, whereas the expression of their true inner emotion increases job satisfaction.[13] Therefore, it is expected that each attribute of emotional

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labor influences nurses differently.

If exposed to stress situations repeatedly, nurses feel skepticism and despair of their existence, and lose a hope[14], but positive changes may also occur, which is called posttraumatic growth.[15] The trauma defined in posttraumatic growth is a crisis event perceived subjectively by a person who already experienced trauma.[16] Nurses in emergency departments care for patients who have suicidal accidents, and are exposed to violent crimes[6], so that they experience relatively more trauma than nurses in wards. Given the point that the cognitive process of a person experiencing a traumatic event influences posttraumatic growth (Han, 2016), it can be expected that there will be a difference in posttraumatic growth depending on the attributes of emotional labor experienced by nurses.

In the previous studies related to the variables in this study, most of researches are looking for the influencing factors on customer orientation or relations between customer orientation and nursing productivity.[4,17,18] As a result, it was difficult to find the influence of customer orientation on each nurse. And most studies on nurses' emotional labor made use of the tool modified on the basis of the tool developed for service employees, and therefore there was a limitation in analyzing domestic nurses' emotional labor[9]. It is difficult to find a research on nurses' posttraumatic growth, and most studies were conducted with ordinary people who experienced trauma[19]. Most studies focused on structural analysis on the influence of cognitive coping and social support on posttraumatic growth on the basis of posttraumatic growth model[20,21].

The purpose of this study is to analyze the mediating effect of each attribute constituting emotional labor on the relation between two attributes with the use of the emotional labor tool developed for domestic nurses.

METHOD

Participants

A convenience sample of emergency center nurses was recruited from four tertiary hospitals in Korea. To determine the appropriate number of participants, we calculated the sample size using the G*Power 3.1.0 program. A power analysis determined that a minimum 131 participants were needed to obtain statistically significant results.

After completing the questionnaire survey, five respondents were excluded due to incomplete data or lack of response. A total of 145 nurses received a self-administered questionnaire. In total, 140 nurses returned the questionnaire. Data from five respondents were excluded from the analysis due to incomplete data or lack of response. Therefore, data of 135 nurses were included in the final analysis.

Measurements

Customer orientation was measured using 12-items SOCO (Selling orientation, Customer orientation).[1] The instrument was translated into Korean and modified for nurse.[22] All items were measured using a 5-point Likert scale from 1 (never) to 5 (always), where higher scores indicated stronger customer orientation. Cronbach's alpha coefficient was reported 0.86[1] and 0.96[22]. This study showed Cronbach's α=0.89.

Emotional labor was measured using 16-items emotional labor for nurses in Korea.[8] This scale divides the nurses' emotional labor from the efforts in emotional harmony and the control of emotional disharmony. The effort in emotional harmony consists of one factor, emotional modulation efforts in profession. The control of emotional disharmony consists of two factors, patient-focused emotional suppression and emotional pretense by norms. All items were measured using a 5-point Likert scale. The scale has three factors: 7-item emotional modulation efforts in the profession, 5-item patient-focused emotional suppression, and 4-item emotional pretense by norms. Higher scores indicated stronger emotional labor. Hong reported Cronbach's alpha coefficients for sub-factors of .80, .77, and .69, respectively.[8] In this study, Cronbach's alpha were 0.83, 0.84, and 0.72 respectively.

Posttraumatic growth was measured using 16 items Korean version of the posttraumatic growth inventory (K-PTGI). PTGI originally was developed by Tedeschi and Calhoun.[8] The K-PTGI has been translated into Korean and modified and has been proven to be a valid and reliable tool within in the Korean population.[23] The adapted K-PTGI has four factors: 6-item changes of self-perception, 5-item the increase of interpersonal depth, 3-item finding new possibilities, and 2-item the increase of spiritual interest. Item responses ranged from 0 (no change) to 5 (high degree of change). Higher scores indicate greater levels of growth. Cronbach's alpha

coefficient was measured 0.94.[23] In the current study, the internal reliability coefficient was 0.91.

Ethical consideration

This study was approved by the Institutional Review Board of D university (CUIRB-2017-0022).

DATA ANALYSIS

The analyses were performed using IBM SPSS Statistics 19.0. Descriptive statistics, correlation analysis and hierarchical regression analysis were used. To test mediation effect of emotional labor, the guidelines provided by Baron and Kenny (1986) were followed. To estimate the mediation effect, Sobel test was used.

RESULTS

Table 1 shows the general characteristics and table 2 shows the score of variables.

Posttraumatic growth was positively correlated with customer orientation (r=.51, p<.001), emotional modulation efforts in profession (r=.55, p<.001), patient-focused emotional suppression (r=.17, p=.047), and emotional pretense by norms (r=.27, p=.002). Customer orientation was positively correlated with emotional modulation efforts in profession (r=.66, p<.001).

Table1. Differences in PTG according to General Characteristics (N=136)

Characteristics	Categories	n(%) or M±SD
Age (years)		29.24±5.34
	≤25	40(29.4)
	26-30	50(36.8)
	31-35	31(22.8)
	≥36	15(11.0)
Gender	Female	124(91.2)
	Male	12(8.8)
Marital status	Married	33(24.3)
	Single	103(75.7)
Education level	Diploma	27(19.9)
	Bachelor	99(72.8)
	Master	10(7.4)
Work experience (years)	Average	6.12±5.09
	≤1	15(11.0)
	1-≤3	29(21.3)
	3-≤6	39(28.7)
	>6	53(39.0)
Emergency work experience (years)	Average	3.86±3.21
	≤1	27(19.9)
	1-≤3	40(29.4)
	3-≤6	47(34.6)
	>6	22(16.2)

Cont... **Table 1**

Table 2. Descriptive Statistics of Variables (N=136)

Variables	Item	Item M	±	SD	Range
Customer orientation	12	3.58	±	0.44	1-5
Emotional labor	16	3.27	±	0.40	1-5
Emotional modulation efforts in profession	7	3.41	±	0.49	1-5
Patient-focused emotional suppression	5	3.21	±	0.70	1-5
Emotional pretense by norms	4	3.10	±	0.52	1-5
Posttraumatic growth	16	2.57	±	0.65	0-5
Relating others	5	2.75	±	0.76	0-5
Changed perception of self	6	2.75	±	0.71	0-5
New possibilities	3	2.80	±	0.87	0-5
Spiritual change	2	1.28	±	1.29	0-5

In this study, all of the basic assumptions of regression sere met. In the first step, customer orientation (independent variable) predicted the posttraumatic growth (dependent variable) (β=.51, p<.001). In the second step, customer orientation significantly predicted emotional modulation efforts in profession (mediator) (β=.66, p<.001). Patient-focused emotional suppression (β=.06, p=.595) and emotional pretense by norms were not predictors of poattraumatic growth (β=.04, p=.200). In the third step, when both customer orientation and

emotional modulation efforts in profession entered, emotional modulation efforts in profession significantly predicted posttraumatic growth (β=.37, *p*=<.001). In the final step, when emotional modulation efforts in profession entered into the equation between customer orientation and posttraumatic growth, the β weigh for customer orientation was reduced (β=.26, *p*<.001) . The results indicated that emotional modulation efforts in profession partially mediated the effects of customer orientation on posttraumatic growth. A sobel test also verified that the mediating effect of emotional modulation efforts in profession was significant (Z=6.29, *p*<.001).

Table 3. Correlations among Variables (N=136)

	CO	EMEP	PFES	EPN
	r (*p*)	r (*p*)	r (*p*)	r (*p*)
Emotional modulation efforts in profession	.66(<.001)	1		
Patient-focused emotional suppression	.05(.595)	.18(.034)	1	
Emotional pretense by norms	.11(.200)	.27(.002)	.27(.002)	1
Posttraumatic growth	.51(<.001)	.55(<.001)	.17(.047)	.27(.002)

CO=Customer orientation; EMEP=Emotional modulation efforts in profession; PFES=Patient-focused emotional suppression; EPN=Emotional pretense by norms

Table 4. Mediating Effect of Emotional Labor between Customer Orientation and Posttraumatic Growth (N=136)

Equations	B	β	t	*p*	Adj. R^2	F	*p*
1. CO→ PG	.99	.51	6.81	<.001	.26	46.34	<.001
2. CO→ Emotional labor							
CO→ EMEP	.44	.66	10.05	<.001	.43	100.98	<.001
CO→ PFES	.03	.06	0.53	.595	.01	0.28	.595
CO→ EPN	.05	.04	1.29	.200	.01	1.66	.200
3. CO, EMEP→ PG					.33	33.65	<.001
CO→ PG	.52	.26	2.81	.006			
EMEP→ PG	1.10	.37	3.98	<.001			
				Sobel test: Z=6.29, *p*<.001			

DISCUSSION

The posttraumatic growth of the subjects in this study scored 2.59 points, lower than the points (2.62) of Chinese nursing university students[24], the points (3.05) of psychiatric nurses overseas, and the points (3.31) of local nurses[25]. According to the research on mental health social workers' posttraumatic growth, as they experience more trauma in work, their posttraumatic growth is more impeded.[26] Accordingly it is possible to infer that such a difference was made by the fact that trauma experiences of nurses in emergency departments were more than those of the subjects in previous studies. Nevertheless, in this study, there was no difference in posttraumatic growth depending on clinical career and nursing career in emergency departments. In the research on nurses in emergency departments, nursing career in emergency departments was not related to posttraumatic growth, and nurses with more than 11 years of clinical career had high posttraumatic growth.[20] The result of this study, posttraumatic growth of nurses in emergency departments was not different depending on their nursing career in emergency departments.

Given the definition of posttraumatic growth which is a qualitative change beyond a previous level of adaptation in an extremely stress situation, [16] it is too bad to see the low posttraumatic growth of nurses

in emergency departments. Such nurses need to see patients with traffic accidents, falling accidents, and suicidal attempts as they are, and experience many conflicts with medical staff in the process of saving their life.[6] Therefore, it is necessary to make an active effort to find a plan for changing their experience in a desirable direction beyond their stress disorder.

In this study, customer orientation influenced only emotional modulation efforts in profession. This result shows that nurses' effort to assess patients' requests and provide proper nursing leads to the positive direction of emphasizing patients with professional attitudes as nurse and expressing their emotions properly depending on situations, rather than the direction of suppressing or pretending emotions. Previous studies reported that customer orientation was related to the achievement of hospital goal, a qualitative improvement in nursing service, and work performance.[4,18] As patients and their caregivers demand better medical service, the importance of customer orientation is emphasized in a clinical setting.[3] However, since customer orientation increases nurses' job stress[4] and lowers their job engagement, [22] it is hard to emphasize customer orientation of individual nurses. Given the point that customer orientation positively influences deep acting effective at alleviating burnout[27], this study result is meaningful in the aspect of nursing organization operation.

Customer orientation was an influential factor on posttraumatic growth, and emotional modulation efforts in profession had the partial mediating effect on the relation between two variables. It means that in the same level of customer orientation, posttraumatic growth can be different depending on emotional modulation efforts in profession. According to the research on school nutritionists, as they accepted and reacted others' emotions in the cognitive analysis process, their deep acting was able to improve[28]. Therefore, it is necessary to find relations between nurses' empathy, emotional modulation efforts in profession, and posttraumatic growth, and to analyze the effect of an empathy improvement program.

This study is meaningful in the aspect that it found relations between customer orientation and posttraumatic growth and analyzed the role of emotional modulation efforts in profession among the attributes of emotional labor in relations between customer orientation and posttraumatic growth, which has not been studied in previous studies.

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Control of Hazardous Chemical as an Effort for Compliance Criteria of OHS Management System : A Cross-Sectional Study at PT. X Surabaya, Indonesia

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ABSTRACT

Background: OHS is a condition that must be realized in the workplace with all efforts based on science and deep thinking to protect the workforce, people, work and culture through the application of accident prevention technology that is done consistently in accordance with applicable laws and standards. The purpose of this study was to determined the appropriate control of hazardous chemicals as an effort to fulfill the criteria in the OHS management system in the welding workshop at PT. X Surabaya, Indonesia.

Method: The research method was cross sectional study. Primary data obtained from the observation with the review of compliance criteria in OHSMS and direct interviews to HSE officer. Secondary data was obtained from corporate documents, including company policies, commitments and Standard Operating Procedures. Data analysis was completed with presentation in the form of tables and explanations.

Result: The results showed that on the principle of monitoring and performance evaluation there are 3rd element with 46 criteria are fulfilled and 1 criterion was not fulfilled the category of minor findings, namely criteria 9.3.5, and the calculation of achievement level was 97,87%.

Conclusion: The conclusion of this study was that the control of hazardous chemicals in the company still not fulfilled the criteria in OHS management system, while the appraisal rate was in satisfactory category.

Keywords: *Hazardous Chemical, OHS Management System, OHS Performance, Risk Management.*

INTRODUCTION

The rapid advancement of technology boosts every sector of the industries to use the modern technology in doing any of their job. The competition of the industry that becomes more competitive demands every company to optimize the whole resource they have, some of them are financial, physical, human, and technology. Human as the resource becomes one of the keys from the success of a development. One of the way to boost the quality of the human resources is by guaranteeing the Occupational Health and Safety (OHS) of every worker, whether for the worker with the lowest risk of work up to those who needs a lot of concentration and great deal of physical power.

The data of International Labor Organization (ILO) mentioned that at 2010 is noted that in each year, more than 2 million people died for the work accident and disease caused by the workplace, and it happened that about 270 million of work accident per year in the world[6]. In Indonesia, the number of work accident indicates a worrying outcome. This thing is based on the result of research of ILO that Indonesia get the 52nd spot from 53rd in how lacking the management of OHS. The cost that will be spent by the company will be massive, if there is any accident in workplace.

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The theory of Domino according to H.W. Heinrich that the cause of work accident, 88% of it is due to unsafe action, 10% of it is because of unsafe condition and 2% of it is unavoidable occurrence [2]. One of the attempt to reduce the unsafe action and the unsafe condition is by doing the risk management. The risk management of OHS related to the danger and the risk that exist in the workplace that can cause loss by the company. If this thing happened beyond control, then it can threaten the continuity of the business or the development process [6].

OHS stands for Occupational Health and Safety, abbreviated as OHS. OHS is a condition that must be realized in the workplace with all efforts based on science and deep thinking to protect the workforce, people, work and culture through the application of accident prevention technology that is done consistently in accordance with applicable laws and standards. Safety is the safety associated with machinery, tools, materials and processing, platform and environment [8].

The Law Number 1 of 1970 about The Work Safety mentioned that every worker has the rights on protection upon the safety in doing the work for the prosperity and increasing production, as well as the national productivity [9]. Based on that, then the company must guarantee the safety and health of the workers when working and when is located in the workplace. While, the Article Number 87 of Law Number 13 year 2003 about The Employment mentioned that every company must apply the occupational health and safety management system (OHSMS) that is integrated with the management system of the company [10].

OHS management system guided by the applicable regulation in Indonesia. Based on Article Number 5 Government Regulation or Peraturan Pemerintah (PP) of Republic Indonesia Number 50 of 2012 about the Application of OHSMS mentioned that every company must apply the OHS management system in its company [5]. The application of OHSMS in companies has the aim to increase the effectiveness of the protection of OHS, as well as the comfort and efficient in pushing the productivity. The number of work accident happened is big enough on the company that can not apply the OHS management system, while the company that has already apply the OHSMS is proven to experience a reduction in the number of work accident.

The result of risk scoring in working process in PT. X Surabaya, Indonesia, that generally the danger is in the category of risk in the level of II, III, and IV. For example, the working in height, operational of forklift, install/dismantling scaffolding, cutting, welding, and grinding. On the process of welding, there is the use of chemical that is acethylene and lubricant oil.

PT. X has applied OHS management system integrated with the management system of this company. The application of OHS management system was done in every process of the work, while monitored by the division named OHS and environment (OHS&E). HSE of PT. X has socialized the programs of OHS&E to all of the workers. There was the HSE plan that functions to increase work and the commitment of application management system in the company, as well as there is the practice of internal audit from that division, as well as the external audit. Therefore, the further research was needed about the control of hazardous chemicals as the attempt to fulfill the criteria based on the Government Regulation of Republic Indonesia Number 50 of 2012 [5]. While the purpose from the practice of this research is to find out the correct control of hazardous chemicals as the attempt to fulfill the criteria in OHSMS.

MATERIAL AND METHOD

The location for this research was in the workshop of the welding of PT. X Surabaya, Indonesia. The time of this research was on February until March of 2017. The method used the descriptive study. This was intended because the result will give the clear and correct picture about the control of the hazardous chemicals as the attempt of fulfilling the criteria of OHS management system based on the Government Regulation of Republic Indonesia Number 50 of 2012 [5].

The primary data in this research was gained from the result of the observation and interview directly. The data obtained by doing some review on the practice of monitoring and evaluation of the work of OHS in company and based on the document related that occur in the workshop of welding of PT. X, as well as adjusted with the condition on site or in workplace. Observation done by using the checklist sheets of criteria upon the application of OHSMS based on Government Regulation of Republic Indonesia Number 50 of 2012 [5]. The direct interview done by using the instrument in the form of structured guideline of interview that composed based on the Attachment II of this Government Regulation that was to the HSE officer. The secondary data obtained

from the archive documented by this company, such as the organization structure, company policy and commitment of the leader, Standard Operating Procedure (SOP), company management system, and the related documents.

FINDINGS/RESULTS

The elements found in the principles of monitoring and evaluation of work of OHS were the monitoring standard; reporting and repairing of lacks; material processing and its mobility; the data collection and usage; as well as the checking or audit of the OHS management system. The fulfilling criteria that occurs inside each of the elements on the practice of monitoring and evaluation for the work of OHS at PT. X Surabaya, Indonesia, presented in Table 1 below.

Table 1. Result of Fulfillment of Criteria in the Practice of Monitoring and Evaluation for the Work of OHS in PT. X Surabaya, Indonesia, 2017

No.	Element	Sub-Element	Criteria	
			Fulfilled	Not Fulfilled (Minor)
	Monitoring Standards	7.1 Checking for danger	7 criteria	-
		7.2 Monitoring/measuring the workplace	3 criteria	-
		7.3 Tools Checking/Inspection, measuring and testing	2 criteria	-
		7.4 Monitoring upon the health of Employee	5 criteria	-
	Reporting and repairing for the lacks	8.1 Reporting of danger	1 criteria	-
		8.2 Reporting of accident	1 criteria	-
		8.3 Checking and study of accident	6 criteria	-
		8.4 Handling of problem	1 criteria	-
	Material management and displacement	9.1 Handling manually and mechanically	4 criteria	-
		9.2 Transporting system, storage and disposal	3 criteria	-
		9.3 Controlling upon the hazardous chemicals	4 criteria	1 criteria
	Data collection and usage	10.1 Note of OHS	4 criteria	-
		10.2 Data and Report of OHS	2 criteria	-
	Checking of SMK3	11.1 Internal audit	3 criteria	
Total			**46 criteria**	**1 criteria**

Based on Table 1 above, it can be found out that from 47 criteria of scoring in practice of monitoring and evaluating the work of OHS PT. X has fulfilled 46 criteria and 1 criteria has not fulfilled with the minor category, that was in the criteria number 9.3.5. The data of the result upon the study indicated that from the five elements in the principles of monitoring and evaluating the work of OHS, there were 46 criteria that is fulfilled and 1 criteria that was not fulfilled (minor category). Then the calculation upon the level of achievement for the practice of monitoring and the evaluating the work of OHS at PT. X was as follows:

$$\frac{\text{46 criteria fulfilled}}{\text{47 criteria}} \times 100\% = \mathbf{97,87\%}$$

Based on the calculation above, then the score achieved in the practice of monitoring and evaluating the work of OHS is 97,87%. Therefore, PT. X was in the classification of "Satisfactory" in term applying the criteria.

DISCUSSION

The monitoring and the evaluating the works of OHS is the requirement in applying the OHSMS that can be used to ensure the practice of OHS in the company works properly and according to the planning. Ramli argued that the principle of monitoring and evaluation of OHS can be used to find out if there is any unwanted violation so that later can be repaired immediately [6]. In the principle of monitoring and evaluating the work of OHS, there are 5 elements with 14 sub-elements, and the total criteria are 47 points.

PT. X has the total employees of more than 200 persons and there are some jobs with relatively high risk of practice so that the scoring upon the practice OHSMS is needed by scoring the monitoring and the evaluation of the work of OHS in every activity and working program that is used. Based on the result of interview with the HSE officer, it was found out that the HSE has done the monitoring upon the practice of all program of OHS&E regularly in every month.

Bird and Germain in the theory of Loss Caution Model focuses on the importance of the role of to prevent and controlling the accidents, that possibly seen as uncontrollable in a complex situation by using the advancing technology [1]. This theory is more prioritizing the direct relationship between the management with the cause and effect from the accident and the multilinear interaction from the order of factors of cause and effect. This theory also explained that the failure in control also influences the occurrence of work accident, including inside is the lack of strength upon the policy and standard of working program. If the policy, rules, and standard do not working well, then unsafe action and unsafe condition might still happen frequently.

The identification of unsafe action and unsafe condition was done through the Hazard Observation (HO), safety patrol, and inspection. The checking or inspection upon the working place and the way employees work was done by the competent safety officer that was properly assigned to and was able to identify danger. This action was done regularly at least monthly. There was a schedule and procedure of operation for the inspection, including the 5R, HO, and JHA. PT. X has kept records of expiration and safe placement as a requirement in the fulfillment of OHSMS on criteria about the control of damaged or expired materials Besides, there also the document of Material Safety Data Sheets that discuss about the safety of materials and how to handle it according to the rules of the constitution, as well as supplemented with clearly tagged label on the hazardous chemicals.

The criteria 9.3.5 in the fulfilling of implementation of SMK3 based on the Government Regulation of Republic Indonesia Number 50 of 2012 [5] that is included in the element of material processing and its mobility, stated that the handle of hazardous chemicals is done by the competent and authorized officer. The handling of the hazardous chemicals in PT. X has done by the competent officer who is a graduate from the chemistry study program. However, this officer has not yet acquire the license or the certificate of expertise for example the certificate of expert chemist so that in this case was a minor category finding in that certain criteria.

The scoring category for the fulfillment of the implementation of SMK3 based on the Government Regulation of Republic Indonesia Number 50 of 2012 [5]. In which the level of achievement of 0-59% is classified in the achievement of "Lacking", the score of 60-84% is classified as "Good", and the score of 85-100% is classified as "Satisfactory".

Based on the result of the study, it can be concluded that the score of OHS implementation is 97.87%, it means that the PT. X has implement SMK3 in the level of "Satisfactory". One of the goal of implementing OHSMS based on the Government Regulation of Republic Indonesia Number 50 of 2012 is to prevent and reduce the number of work accident as well as the sickness due to the work [5]. The consistent implementation of SMK3 can be useful as the protection for the workers. PT. X has applied management system of occupational safety and health to achieve zero accident. However, it is undeniable that there are still some danger potential and risks in each processes of work or production.

CONCLUSION

Based on the result of the study, then the following conclusions can be drawn:

The minor finding in the scoring of the practice of monitoring and evaluating the work of OHS is in the criteria 9.3.5, that is the welding workshop of PT. X has acquired the procedure of storage, handling, and the mobility of hazardous chemical, as well the marking system or the tag labelling done by the authorized officers that is competent with the chemistry educational background, yet the officer has not acquired any special certificate (expert of OHS in chemistry).

Based of the calculation upon the level of achievement of the practice of monitoring and evaluating the work of OHS that PT. X was in the category of "Satisfactory".

RECOMENDATION

Assign or point one or more officers in handling the hazardous chemicals and giving the training upon the danger and the way to handle or control that, as well as planning the certification program for the specific skill that is suitable that is the OHS experts in chemistry and the OHS of chemistry officers based on the Decree of the Minister of Employment of Republic Indonesia Number Kep.187/MEN.1999 [4] about the control of hazardous chemicals in workplace. This is related to the use of acethylene in the welding working process and the lubricant oil used in the workshop.

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Balanced Nutrition Menu Intervention for Toddlers in Children Daycare Center

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ABSTRACT

Background: Children Daycare Centers are alternatives for parents to entrust their children. However, children at the golden age of must be fulfilled their nutritional intake as experiencing lack of food at that time will have a serious impact. This way, efforts should be made to ensure that Children Daycare Centers or in Indonesia is known as *Tempat Penitipan Anak* (TPA), are able to provide the best services to children, both in terms of care and provision of food intake. The research aims at providing intervention needed to change the situation in the site so that the implementation of meals served have a good impact on the children.

Method: This is a pre experimental one group pretest posttest observing children aged 4-6 years. Interventions provided in the form of balanced nutrition food 1 menu cycle for 30 days in accordance with the nutritional adequacy of lunch and snacks. The analysis used was the T- test.

Results: There was a relationship between energy intake and children's nutritional status (P -value 0.024), there was a difference in nutritional status between before and after the intervention (P -value 0.004) .

Conclusion: Childcare places need to apply balanced nutritional food in an effort to maintain and improve the nutritional status of children. The application of a suitable diet is very necessary so that food intake in children becomes optimal. Modification of types of food that can be adjusted to the child's desires based on the nutrition adequacy rate for children.

Keywords-*: Children Daycare , Balanced Nutrition, Nutritional Status, Intervention*

INTRODUCTION

Children daycare, known in Indonesia as *Tempat Penitipan Anak* (TPA), is an alternative for parents to entrust their children for family replacement for a certain period of time for children during parents work as well as the implementation of educational programs (including care) against children from birth to 6 years of age [(1)]. Children aged 0-6 years are in the golden and critical period. Toddler raised by parents with care for other than parents showed differences in the development where the children cared for by parents become better than children being cared by others than parents [(2)]. Therefore parenting and organizing meals in children daycare are one of the factors in child development.

For every food administration, both performed non-commercially and commercially such as in the daycares, completeness and the adequacy of nutrients in the food served must be in accordance with the guidelines in the preparation of the food menu being served. In fact, in the city of Palangkaraya, the results of research [(3)] on food remaining analysis using the Comstock method indicated that the energy served on the first, third and sixth day are meeting the standard (≥80%) while the second day, fourth and fifth is not appropriate (<80%). Proteins served on the first, second, third, fifth and

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sixth days are fitted (80%) while the fourth day is not suitable (<80%). For leftover food remnant based on 6 days of lunch served on the second day is that the remaining food staple is 48.86%, vegetable side dish is 48.86%, vegetable is 56.82%, fruit is 31.82% and on the sixth day, the animal side dish is 51.04 %. Thus, it is concluded that the energy and protein served do not meet the standards. These results also blatantly indicated that that the availability and the intake of children nutrition in the daycare is less than the nutritional adequacy rate . Based on the aforementioned matters, the authors are interested in conducting a research on the intervention of a balanced nutrition menu in the daycares located in Palangkaraya, the capital of central Kalimantan Province, Indonesia.

METHODOLOGY

This research uses quantitative methodology with design *pre-experiment one group pretest posttest,* held in September 2017 in Darussalam Child Daycare Center Palangkaraya , Indonesia. Interventions are given in the form of a balanced nutritional food cycle which is calculated using the nutrition adequacy rate based on age. Balanced nutrition food is given at lunch 30 times in 30 days. The average adequacy of nutritional substances for children lunch each cycle consists of energy = 358.29 Kcal and protein of 12.18 gr. The nutritional content is made in a portion of food consisting of lunch and dessert snacks. Every 1 week children are given six times lunch on Monday to Saturday, with different menus every day. The intervention of the effectiveness of the provision of a balanced nutrition diet is measured by assessing the child's weight between before and after the intervention. In addition, the child's intake of balanced nutrition is also measured in the form of percentage of intake.

The sample size to be analyzed is 18 samples. Univariate analysis is used to analyze data by describing the results of research on each variable studied. Percentage value is used to display data on children's food intake as well as the mean, standard deviation, confident interval and minimum-maximum for numerical data on children's weight. Bivariate analysis is used to analyze the relationship between two variables. Statistical test of *paired t-test* analyzed the difference in average body weight between before and after the intervention as well as the difference in average body weight between adequate intake and poor intake based on nutrients, the degree of significance using α (alpha) = 0.05.

RESULTS

Food nutrition in children is converted into a percentage of intake by comparing nutrient intake with standard intake for the children generating the results of 72.2% of energy intake which is ≥ 75%, and 44.4% protein intake which is also ≥75%.

Table 1 shows that children with ≥ 75% energy intake have an average of Z-Score 0.207, while energy intake < 75% has Z-Score -1.09. Both of these Z-Score values in anthropometric standards assess the nutritional status of children is still in the range of good nutrition. There is a significant difference in the mean score of Z-Score between energy intake ≥ 75% and energy intake < 75%. Table 1 also shows that children with a protein intake of ≥ 75% had an average of Z -Score 0.126, while protein intake < 75% had an average of Z-Score -0.38. There was no significant difference in the average Z-score value between protein intake ≥ 75% and protein intake < 75%.

Table 1. Average Difference Analysis on Nutritional Status of Children

Variable	Intake	Mean Weight / Age	SD	Levene Test	Difference	*P Value*
Z-Score (Weight / Age)	≥75% Energy Intake (n = 13)	13	0.69	0.121	1.305	0.024
	Energy intake < 75% (n = 5)	-1.09	1.57			
Z-Score (Weight / Age)	Protein intake ≥75% (n = 8)	0.126	0.37	0.005	0.507	0,507
	Protein Intake <75% (n = 10)	-0.38	1.48			

Table 2. Analysis of Differences in Body Mass Index (BMI) of Children Before and After Intervention

Age	Variable	Description	Mean	Min - Max	Score Correlation Value (R)	Difference	*P- Value*
4-6 years	BMI Z Score (Body weight / Age)	Before	- 0.43	-2.72 - 1.39	0.951	0.280	0.004
		After	-0.15	-2.5 - 1.58			

The average Z score before intervention was - 0.43 while after the intervention the average Z score is -0.15. The difference in knowledge scores after treatment is t an increase of 0.28. Statistically there are differences in the average Z score before treatment and after treatment with p -value = 0.004. The correlation value (r) square produced 95.1. This shows that the provision of balanced nutritional food and eating regulations play a role of 95.1% in improving the nutritional status of children in child daycare while the rest is caused by other factors.

DISCUSSIONS

Organizing meals is a series of activities ranging from menu planning to distribution of food to consumers, including recording, reporting and evaluation activities aimed at achieving optimal health status through proper feeding. Based on its function, organizing meals can be divided into two, namely commercial and non-commercial. The organization of meals at Darussalam Child Daycare is a non-commercial operation, namely the provision of food that is not profitable. Looking at the conditions as in the results of the study, it is concluded that the food administration program still does not follow the standard pattern of service management and technical instructions. This is stated in the results of the study that food management depends on the available funds and menu planning and there are no standard portions or prescription standards.

Results showed that children's energy intake was mostly > 75%. Children's energy intake is derived from modification of food that has been provided for 30 times, namely in the form of food types which has been processed in such a way as to increase children's interest in consuming it. The results also showed that there were differences in the average nutritional status between energy intake ≥75% and <75%. There was a significant relationship between energy intake and nutritional status in children.

Food substances needed by the human body include carbohydrates, proteins, fats, vitamins, minerals and water. Food consumed by children is metabolized by the body so that it becomes energy and is useful for child growth and development. Energy in the human body arises due to the burning of carbohydrates, proteins and fats. Thus, in order to fulfill their energy needs, it is necessary to consume enough food substances into the body. Childhood age 4-6 years is a time when children are very active in carrying out various activities together with their peers [4]. When a child has more energy than is consumed, it can cause weight loss. If the child has a lack of energy, it will have an impact on physical growth, mental and endurance [5]. This research is in line with the previous research results showing that 91.7% of adequate energy consumption has nutritional status will not experience underweight [6]. Another research also shows that there is a significant relationship between energy intake and nutritional status of children [7]. Further, children with less chance of energy intake is 2.43 times to experience less nutrition compared to children with adequate energy intake [8]. From the results of the study it is concluded that adequate energy intake affects the nutritional status of toddlers better.

Results showed that there was no difference in the average nutritional status between children with protein intake ≥ 75% and <75%. Children with an intake of ≥ 75% are 8 people and <75% are 10 people, if it is nearly equal it is 1: 1.25. The results of this study are in line with the results which showed no relationship between protein intake and nutritional status [9]. Also another study showed no relationship between protein intake and nutritional status [10] and no correlation between protein intake and nutritional status [11].

In fact, proteins chemically have atoms that are the same as fat and carbohydrates, only the difference is the element of nitrogen. One of the important food substances for the body is protein. Protein is a part of

living cells and is the largest part after water. Enzymes, hormones, nutrient transporters and blood are proteins. The main function of protein is to build and maintain body tissues. Protein is also the same source of energy as carbohydrates. If the body is in a state of lack of energy zumber such as carbohydrates and fats, the body will use protein to form energy and exclude its main function as a building agent. In children this condition can have an impact on growth disorders. Consumption of adequate protein intake will have an impact on good growth the body's immune system increases, creativity increases and has a strong mentality [12] supporting previous research that children with good food intake, as many as 75% were in the category of good nutrition as well [13] and children with less protein intake is 2.63 times risk of experiencing poor nutritional status compared to children with adequate protein intake [14].

Protein intake in the child daycare is a protein intake as long as the children receives a balanced nutrition food modification intervention. Protein intake in the landfill during part of the study was good enough > 75% . The protein is derived from animal protein so that it can provide a fairly good intake. The absence of a relationship between protein and children's nutritional status was due to the average nutritional status of children at both < 75% and > 75% intake. In this study, food directly affects the nutritional status of children. This is because the researchers have since sampled the samples by selecting research locations in child care centers so that other confounding variables can be minimized. Balanced nutrition foods that have been modified have an effect on the nutritional status of children, indicated by the difference in Z score value of 0.280. Nutritional status is a balance between food intake and body needs (output). Children with inadequate food intake both in terms of the amount of intake and in terms of nutritional value will weaken their endurance and easily suffer from pain. If a child experiences a weak immune system, it will certainly affect the child's nutritional status [15].

Previous research also showed that feeding patterns affect the nutritional status of children. The feeding pattern in question is from the type of food, amount of food (nutritional adequacy) and meal schedule [16]. Children with the right diet were 122 children (89.7%) had nutritional status in the normal category . Food consumption affects a person's nutritional status. Good nutritional status or optimal nutritional status occurs when the body produces enough nutrients that are used efficiently so as to enable physical growth, brain development, work ability and general health at the highest level possible.

CONCLUSION

Child Care Centers in Central Kalimantan Indonesia does not apply a balanced nutritional food in an effort to maintain and improve the nutritional status of children. This may due to lack of the knowledge and feeding toddler may be considered as a social activity only. The Daycare unit should apply a suitable diet is needed so that food intake for children is optimal by modifying types of food that can be adjusted to the child's desires, still based on the nutrition adequacy rate in children.

Ethical Clearance: The Ministry of Health Polytechnic approved this research in Central Kalimantan, Indonesia. Ethical clearance was obtained from the Faculty of Medicine Palangkaraya University, Indonesia. A research permit was requested from the local health authorities. We also wish to thank all the participants who contributed to this study.

Conflict of Interest: Nil.

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The Effectiveness of Acupressure at LI 4 and SP 6 Point on Uterine Contraction in the First Stage of Labor on Primiparous Women

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ABSTRACT

Background: Maternal Mortality Rate is still dominated by causes such uterine contractions, prolonged labor. Cesarean section and labor induction are still an effort to prevent these complications. Meanwhile, these solutions have complications such as infection risk, hypertonic contraction, fetal trauma, etc. In this study, acupressure technique is one of the answers to increase uterine contractions so that cesarean section and labor induction can be avoided. Acupressure is a non-pharmacological, non-invasive uterine stimulation technique, which is simple, safe, effective, and without serious side effects. This study aims to analyze the increase of uterine contractions in the first stage of normal labor with acupressure treatment

Method: This study is a randomized controlled trial on 39 primiparous mothers during the active phase of the first stage of normal labor were equally assigned to two intervention groups [acupressure on LI 4 (n = 13) or SP 6 (n = 13)] and a control group (n = 13). The intervention group received routine labor care and acupressure in LI 4 or SP 6 point bilaterally for 20 minutes; control group just received routine labor care.

Results : There were significant differences between the three study groups at the frequency (p = 0.000), duration (p = 0.000) and interval of the uterine contraction (p = 0.000). After post hoc test, the mean of frequency, duration, and interval uterine contraction most significant increased between SP 6 and control group (p = 0.000).

Conclusion: Acupressure on LI 4 and SP 6 point are effective in increasing uterine contraction compared with the control group with the most significant result in acupressure at SP 6 point.

Keywords- *Acupressure, first stage of labor, uterine contraction*

INTRODUCTION

Maternal Mortality Rate is still dominated by causes such uterine contractions, prolonged labor. Cesarean section and labor induction are still an effort to prevent these complications [(1)] but these solutions produce complications such as infection risk, hypertonic contraction, fetal trauma, etc [(2)] . Acupressure technique is one of the answers to increase uterine contractions so that cesarean section and labor induction can be avoided.

Acupressure is a non-invasive, non-pharmacological, simple, safe, effective without dangerous side effect method which is used to augment labor, provide labor pain relieve, and shorten the first stage of labor duration [(3)] . Many studies have proven that acupressure can increase uterine contractions. From 7 reviews on the effects of acupressure on the length of labor, 5 studies showed the results of the period of the first stage of labor were shorter acupressure compared to those not given acupressure. A variety of acupoints are useful to increase

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uterine contraction and shorten the first stage of labor duration, are LI 4 and SP 6 points [4].

Research on acupressure for the advancement of childbirth has been widely studied, but until now the results of the study have not calculated and recorded the frequency, duration, and interval in detail through the detailed recording is essential to assess the progress of labor. Further, most of the research results are only focussed on the duration of labor and the frequency of uterine contractions just. In this study, uterine contractions were calculated and recorded in detail and analyzed for the increase between the point acupressure intervention group LI 4, SP 6 point, and the control group.

METHOD

Setting and Participants

This randomized controlled trial posttest only design was carried out on primiparous women in 11 community health center at Semarang, Central Java, Indonesia from 22 May to 22 July 2018. The inclusion criteria were : primiparous women in normal labor, age range of 20 – 35 years, term pregnancy (37 - 42 weeks of gestation), fetal vertex presentation, and being inactive phase of first-stage labor with cervical dilatation of ≥4 cm and presence of at least three uterine contractures within 10 min, mother and fetal were health (not suffering from diseases that cause labor complications), singleton pregnancy, Body Mass Index (BMI) 18.5 -25.0, mother eats before delivery. The exclusion criterion was: mother get labor augmentation using uterotonics, having coitus in the last 24 hours, there are wounds on the SP-6 and LI-4 acupressure points, delivery time > 24 hours or prolonged labor, patients fall on early membranes rupture.

Randomization and intervention

The first step of the trial is randomized of 11 community health center in Semarang (cluster sampling) to assign the locations into three groups. The primiparous women who were admitted for regular delivery to the community health centers and met the inclusion criteria were selected and then were assigned to three groups based on cluster sampling of 11 community health center in Semarang. Three groups included: a group that received acupressure on LI4 point, a group that received acupressure on SP 6 points, and the control group.

Before beginning the intervention, cervical dilatation and uterus contractions were checked. Acupressure was applied bilaterally during the contraction on Hugo point (LI4), which is located on the medial midpoint of the first metacarpal within the skin of the thumb and the index finger or on San Yin Jiao Point (SP 6) which is located on the three *cun* above the medial malleolus.

The respondents of LI 4 group were asked to lie down in supination position, and the researcher sat in beside them. The researcher applied pressure to the LI 4 point of both hands by her both thumbs. To prevent any discomfort, the pressure was applied with *Pu* technique which is pressing the spot gently. At the beginning it must be done lightly then gradually the strength of the emphasis is added until it feels a light sensation but does not hurt. The focus with a clockwise circular massage. Applying pressure was stopped by the end of each contraction and was started again by the beginning of another contraction. This was repeated for 20 minutes.

The respondents of SP 6 group were asked to lie down in supination position, and the researcher sat in front of their leg. The researcher applied pressure to the SP 6 point of both legs by her both thumbs. The pressure technique and duration of giving acupressure were the same as the group above. For the control group, the researcher attended the bedside of the respondents and performed all the routine labor care but did not apply acupressure. The researcher just conducted the palpation examination to measure the frequency, duration, and interval of uterine contraction.

Outcome measurement

The assessment of the respondent's age, education, and occupation have used a questionnaire. To keep the confidentiality of respondents, we use codes to identify replacing the respondent's name. The frequency, duration, and interval of uterine contraction were measured by palpation examination at respondent's abdomen during the first stage of labor. The WHO's partograph is used to record the frequency of uterine contraction and cervical dilatation. The duration and interval of uterine contraction were recorded in the observation sheet.

Statistical Analysis

The minimum number of sample size for each group was determined to be 9. Considering the possibility of missing some cases, the sample size for each group

was determined to be 13. Chi-square test was used to determine the difference of respondent's education and occupation among three groups. ANOVA was used to determine the mean difference of respondent's age, also to learn the difference of interval and followed by Bonferroni post hoc test to determine which group that had the most significant result compared with control group. Kruskal-Wallis Test was used to compare obstetric characteristics, frequency, and duration of uterine contraction between three groups of study, because of lack of normal distribution and followed by Mann-Whitney test. For all analyses, the statistical significance was defined as $P < 0.05$.

RESULT

Demographic and obstetric characteristics

All 39 women completed the study. As presented in Table 1, there was no significant difference in demographics (age, education, and occupation) and obstetric (gestational age, cervical dilatation) characteristics among the groups.

Table 1. Comparison of demographic and obstetric characteristics among the three groups

Variables	LI 4 (n = 13)	SP 6 (n = 13)	Control (n = 13)	p
Age (mean ± SD) years	23.6 ± 1.8	22.7 ± 1.8	23.4 ± 2.1	0.865[a]
Education n (%) Elementary Junior High Senior High College or above	 1 (7.7) 2 (15.4) 9 (69.2) 1 (7.7)	 0 (0) 5 (38.5) 8 (61.5) 0 (0)	 0 (0) 2 (15.4) 10 (76.9) 1 (7.7)	0.516[b]
Occupation n (%) Housewife Employed Gov. employee Entrepreneur	 3 (23.1) 5 (38.5) 2 (15.4) 3 (23.1)	 4 (30.8) 6 (46.1) 1 (7.7) 2 (15.4)	 1 (7.7) 7 (53.8) 1 (7.7) 4 (30.8)	0.777[b]
Gestational Age (mean ± SD) weeks	39.9 ± 0,8	39.9 ± 0.9	39.9 ± 0.9	0.966[c]
Cervical Dilatation (mean ± SD) cm	4.5 ± 0.7	4.8 ± 0.8	4.8 ± 0.7	0.362[c]

ANOVA

[b]Chi Square

Kruskal Wallis

Uterine Contraction

Table 2 presents the difference between mean uterine contraction (frequency, duration, and interval) among groups. Kruskal Wallis test demonstrated a significant difference in the rate of uterine contraction between LI 4, SP 6 and the control group ($p = 0.000$). Kruskal Wallis also attested significant difference in duration of uterine contraction between LI 4, SP 6 and control group ($p = 0,000$). ANOVA test proved a significant difference in the interval of uterine contraction between LI 4, SP 6 and the control group ($p = 0.000$).

Table 2. Comparison of uterine contraction among the three groups

Variables	LI 4 (n = 13)	SP 6 (n = 13)	Control (n = 13)	p
Frequency (mean ± SD) times/10 minutes	3.5 ± 0.2	3.7 ± 0.1	3.4 ± 0.1	0.000[a]
Duration (mean ± SD) seconds	43.8 ± 0.9	47.8 ± 1.4	42.7 ± 0.7	0.000[a]
Interval (mean ± SD) minutes	3.3 ± 2.5	2.9 ± 0.2	3.5 ± 0.1	0.000[b]

[a]Kruskal Wallis

[b]ANOVA

Table 3 presents a comparison of uterine contraction (frequency, duration, and interval) between the three groups. The efficacy of frequency of uterine contraction from the view of the women was significantly higher in LI4 and SP 6 groups compared with controls, with the most significant difference in SP 6 group (p = 0.000). The difference of duration of uterine contraction from the view of the women was significantly higher in LI4 and SP 6 groups compared with controls, with the most significant difference in SP 6 group (p = 0.000). The difference of interval of uterine contraction from the view of the women was significantly greater in LI4 and SP 6 groups compared with controls, with the most significant difference in SP 6 group (p = 0.000).

Table 3. Post hoc test of uterine contraction among the three groups

Variables	Group	Group	Mean Difference	Sig.
Frequency	LI 4 SP 6	Control	0.1 0.3	0.065[a] 0.000[a]
Duration	LI 4 SP 6	Control	1.1 5.1	0.199a 0.000[a]
Interval	LI 4 SP 6	Control	0.2 0.5	0.018[b] 0.000[b]

[a]Mann Whitney

[b]Bonferroni

DISCUSSION

In this randomized controlled trial, we investigated and compared the effect of LI 4 and SP 6 acupressure with the control group on uterine contraction inactive phase of the first stage of labor. In the present study, the significant increase of frequency and duration of uterine contraction, also the substantial decrease in the interval of uterine contraction, between intervention and control group supports the effectiveness of applying pressure to LI4 and SP 6 points in increasing uterine contraction. This result also showed that acupressure on SP 6 points is more effective than on LI4 point in increasing uterine contraction.

The results of this study are in line with the research conducted by Ozgoli [(6)] on the effects of acupressure LI 4 and BL 32 on delivery outcomes, one of which is the result of the acupressure effect of uterine contractions. The results of this study confirm our findings concerning the stimulation of LI 4 point. But the result of these study is not showed significant different because applied unilateral pressure. In this study researcher applied bilateral pressure, that probably responsible for its higher effectiveness in comparison with applying unilateral pressure.

This study is also in line with the randomized controlled trial study conducted by Mafetoni and Shimo [(7)] about the effects of acupressure on the progress of labor

and the incidence of cesarean section. The results of this study indicate that mothers who were given acupressure therapy at SP point 6 duration of labor were significantly different compared to placebo and control groups. The results of this study confirm our findings concerning the stimulation of SP 6 point. In this study, acupressure at point SP 6 was shown to increase the hormone oxytocin which can facilitate labor.

Acupressure is a non-invasive therapy for labor and makes parturients stay comfortable during labor. Experimental studies of the effects of acupressure on the duration of the 1st stage of labor have been widely performed in Asia. In these studies, the acupressure point that gives the most significant results is the SP 6 point, then the point LI is 4 [8,11] .The results of this study confirm our results concerning stimulation of SP 6 point.

Acupressure at point SP 6 has a strong influence on the reproductive organs. Stimulation at this point can increase the concentration of yin energy that can initiate labor. The effect of acupressure Yin energy can increase uterine contraction because it has been shown to increase the oxytocin hormone [12] . During labor, there is a blockage of the meridian which causes the flow of meridians to flow through the body. Stimulus at point SP 6 or LI 4 can open blockages and facilitate meridian flow. This also makes the mother calmer during labor. Stimulus at this point can also increase the hormone oxytocin from the pituitary gland which causes an increase in uterine contractions during labor [13,14] .

CONCLUSION

This study showed that both LI 4 and SP 6 acupressure significantly increased the frequency and duration of uterine contraction, also significantly decreased the interval of uterine contraction in the first stage labor with the most significant result in acupressure at SP 6 point. Our study was one of the few limited studies that were performed to determine the effect of acupressure on uterine contraction. We presented information that could be confirming the physiologic process of acupoints function.

The weaknesses of our study are the factors that influence labor contractions such as psychological factors (fear, anxiety, tension, stress) have not been controlled. Assessment of uterine contractions has not used biomarkers (biophysical or biochemical markers). Further trials are needed to control the psychological factors and using biomarkers to get a more valid result. The results of this study can be useful in the planning of programs promoting the care of women in labor.

Conflict of Interest: We have no conflicts of interest to the material of this manuscript.

Ethical Clearance: The trial was approved by the Ethics Committee of Health Polytechnic Semarang, Indonesia.

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Soft Tissue Dental Lasers

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ABSTRACT

The term LASER stands for Light amplification by stimulated emission of radiation. Nowadays numerous types of laser systems are available for use in the Dental field. The Dental practitioner should be familiar with these devices and should be aware of the possibilities and limitations of each type of Laser. In this paper, the different types of Lasers and their applications in Dentistry, and precautions to be taken when using lasers are discussed.

Keywords: *Laser, soft tissue, Laser safety, Diode Laser, Laser hazards.*

INTRODUCTION

One of the most exciting developments in medical technology is the laser. Dentists have not been slow in examining lasers for possible use in their own field. Initial results met with a mixed success, but the last few years have been much more promising.

In one generation lasers have moved out of the realm of fantasy into everybody's life from outer space to laser printers and copiers in office. Lasers do have far reaching potential for application to various fields. The laser effect is undoubtedly one of the major breakthroughs of this century.

Lasers are an impressive potential treatment modality for a variety of clinical conditions. Recent advances and developments have led to an increased acceptance and research of this technology by both practitioners and general public.

A ***laser*** (from the acronym of ***Light Amplification by Stimulated Emission of Radiation)*** is an optical source that emits photons in a coherent beam[1].

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COMMON LASER TYPES USED IN DENTISTRY[2]:

Laser type	Medium	Wavelength in nanometers	Delivery system
Argon	Gas laser	488,515	Optical fibre
KTP	Solid state	532	Optical fibre
Helium-neon	Gas laser	633	Optical fibre
Diode	Semi conductor	635,670,810, 830,980	Optical fibre
Nd: YAG	Solid state	1064	Optical fibre
Er: YAG	Solid state	2940	Optical fibre, wave guide, articulated arm
CO_2	Gas laser	9600,10600	Waveguide, articulated arm

LASER TISSUE INTERACTION

Each tissue type has a specific energy absorption pattern. Laser absorbed by tissues are strictly frequency and tissue dependent. Because of the limitations of laser physics and tissue biophysics, one laser cannot be applied to all the various tissue types with complete efficacy.

When laser strikes tissue it is absorbed, reflected, scattered or transmitted in various degrees and combinations. Absorption results in energy from the photons being transferred to the tissue, causing a thermal or non-thermal reaction depending on the wavelength and the energy of the incident photons in the beam. Consequently, energy absorbed at deeper levels may be greater than that in the superficial layers. Tissue absorption is low with Nd: YAG lasers; has optical scattering with deeper and uniform penetration within tissue.

Lasers are highly pigment-specific and the addition of a pigment to a non-pigmented area will result in increased absorption. Since tissues are composed of specific cells and molecules, the radiation may be absorbed superficially or at depth, depending on the radiation and the concentration of these cells and molecules[3].

Non-thermal effects can be grouped into ***photochemical*** and ***photodecomposition***. Photochemical effects are poorly understood but involve irradiation with laser powers measured in mill watts, producing little or no temperature effect, with the energy absorbed producing instant changes in chemical and physical properties of atoms and molecules. Photochemical processes can change to photothermal effects if energy densities are increased. ***Photodecomposition*** effects include ***photoablation*** and ***photodisruption.*** Photoablation breaks up atomic and molecular bonds of the target tissue with no damage to the adjacent tissue. Only excimer lasers (those operating in the ultraviolet range) are capable of emitting radiation with energies high enough to dissociate atomic and molecular bonds in this manner. Photodisruption involves the use of very high energy and very short pulse duration lasers to produce *plasma* (a cloud of ionized particles the overall charge of which is neutral), which destroys tissue mechanically by the generation of a secondary shock wave[3].

CO_2 lasers have the most absorption, with basically negligible scattering followed by the argon laser.

Diode laser

The diode soft tissue laser is a highly effective and predictable new device for simple recontouring of tissue, requiring only a topical anesthetic. Its wavelength is between 800 and 980 nm, appropriate for removing soft tissues due to their pigmentation and hemoglobin content. Energy from the laser is converted in a photo thermal reaction making it possible to paint away targeted soft tissue in a controlled and focused manner without unwanted side effects on the surrounding teeth[1,4].

The diode laser is activated with a foot pedal. The operator gently moves the fibreoptic wand over the target tissue using a light brush stroke to paint away the desired amount of tissue. Care should be taken to avoid excessive contact, which might cause unwanted collateral damage. After laser procedure, cotton balls soaked in hydrogen peroxide is used to debride the area of charred tissue.

Advantages:

Single appointment procedure using topical anesthetic with little pain or bleeding.

Cost effective.

Reduces treatment time.

Vastly improves esthetic results.

FOR GINGIVAL RECONTOURING AND SCULPTING

Uneven tissue levels are recontoured successfully with Lasers. The tissues will normally adjust to the reconstituted bone heights once the appliances are removed, gingival swelling subsides and oral hygiene improves. Occasionally the tissue levels will not align properly due to the distance of tooth movement, periodontal response or poor hygiene.

Sculpting or reshaping the tissue once swelling has subsided can create a more pleasant smile and improve periodontal health where residual gingival hypertrophy exists. Diode lasers can be used for recontouring the gingival margin resulting in enhanced esthetics[4].

FRENECTOMY

Frenectomies requires the removal of fibrous interseptal tissue which can be done successfully with the use of a diode laser.

Diode and Er: YAG lasers in labial frenectomy in infants [5]

Different high power lasers: diode (810 nm) and Er: YAG (2940 nm) are used. The diode laser has high

absorbance by pigmented tissues with hemoglobin, melanin, and collagen chromophores. For this reason, this wavelength is well indicated for surgery in soft tissue (vaporization, incision, coagulation and hemostasis). It is not properly absorbed, however, and should never be used in contact with hard tissues (bone).

The Er: YAG laser has high absorbance to water and mineral apatite, making this wavelength useful and safe for the ablation of hard tissues. In the labial frenectomy clinical procedure, a combined technique is suggested: using the diode laser in soft tissues and the Er: YAG laser in periosteal bone tissues and for removal of final collagen fibers.

ACCESS GINGIVECTOMY[6]

When a tooth resists eruption with a thin layer of tissue covering its surface, treatment can be delayed for months. Diode laser can be used for removal of tissue covering unerupted teeth.

Removal of such tissue should be performed carefully so that tooth is exposed only to the extent needed to place a bracket. The laser vaporizes the tissue without bleeding, allowing the tooth to be etched, sealed and bonded. This allows for easier and faster alignment of tooth into the arch.

GINGIVECTOMY OF HYPERTROPHIC TISSUE[7]

Hypertrophic tissue can swell around orthodontic brackets, inhibiting oral hygiene and slowing tooth movement. Even prodigious tooth brushing may not be enough to make this excess tissue recede and the orthodontists have few options short of appliance removal.

The diode laser can quickly and easily remove swollen tissue without undue patient discomfort. The removal of the appliance until the swollen gingival tissue recedes results in unnecessary delay in the treatment leading to increased treatment time.

OPERCULUM REMOVAL

Operculum covering the unerupted teeth especially in the third molar areas creates pain and discomfort to the patients. The operculum around the uneruped tooth also poses a problem for the Orthodontist especially during treating mixed dentition patients. This comes in the way of band and bracket placement resulting in unnecessary gingival bleeding, gingival injury and increase in the treatment time[8].

Diode lasers can be used for the removal of the operculum covering erupting teeth. This tissue can be easily removed with the diode laser without any patient discomfort thereby preventing delay in treatment time[8].

Lasers can also be used for veneer placement, treatment of apthous ulcers and herpetic lesions[9].

Laser Hazards:

The laser produces an intense, highly directional beam of light. The most common cause of laser-induced tissue damage is thermal in nature, where the tissue proteins are denatured due to the temperature rise following absorption of laser energy.

The human body is vulnerable to the output of certain lasers, and under certain circumstances, exposure can result in damage to the eye and skin. Research relating to injury thresholds of the eye and skin has been carried out in order to understand the biological hazards of laser radiation. It is now widely accepted that the human eye is almost always more vulnerable to injury than human skin. The intensity of laser radiation is often such that exposure can result in serious and permanent injury to skin and eyes[10].

Laser Classification based on hazards[11]

Lasers and laser systems are classified by their ability to cause biological damage to the eye or skin during used

Class I Lasers

Lasers or laser systems incapable of producing damaging radiation during intended use are Class I lasers. These lasers are exempt from any controls or administrative requirements during normal use.

Class II Lasers

Class II lasers (low power) are lasers emitting radiation in the visible portion of the spectrum. Even though the power of these lasers is such that they will normally be protected by a physiological aversion response (blink reflex), personnel should wear laser eyewear for protection.

Class III Lasers

Class III lasers and laser systems (medium power) produce radiation that can cause eye damage when viewed directly, or when a specular reflection is viewed. A diffuse reflection is usually not a hazard.

Class IV Lasers

Class IV lasers and laser systems (high power) produce radiation that may be dangerous to the eye even when viewing a diffuse reflection. The direct beam can produce skin damage and can also be a fire hazard.

Eye Injury[10,11]

The site of injury following laser exposure depends on the wavelength. Ultraviolet with wavelengths from 0.2 to 0.215 mm and infrared with wavelengths of 1.4 mm or greater are absorbed in the cornea. Wavelengths from 0.78 to 3 mm are also partially absorbed in the lens. Visible light of 0.4 to 0.78 mm is transmitted to the retina. Some light with wavelengths from 0.78 to 1.4 mm will also be transmitted to the retina.

Acute exposure of the cornea can cause corneal burns, or photokeratitis (welder's flash). Lens opacities (cataracts) are associated with chronic exposure of the lens. Chronic exposure of the retina may also result in retinal injury.

Objects in the center of the field of vision are focused on an area of the retina called the fovea. This area of the retina is the most sensitive and is responsible for most of our visual activity. Injury of the fovea may result in permanent blindness in the injured eye. If the peripheral areas of the fovea are injured, the effect on vision is less serious. In some cases the effects are not noticeable or distracting.

Skin Injury[10,11]

Skin burns are caused by radiation from high-powered lasers in the infrared. Exposure to the skin in all wavelengths may result in erythema, skin cancer, skin aging, dry skin effects, and photosensitive reactions in the skin.

Thermal effects

Temperature rise of more than 6°c can cause irreversible pulpal reaction and temperature in excess of 11°c may cause necrosis of pulp. Temperature of this magnitude is known to occur during cavity preparation with uncooled burs (or) during polishing and finishing of restorations. [1, 31]

If the insult to the pulp is great enough, burn lesions can present as coagulation necrosis and often develop intra-pulpal abscesses. Abscess formation appears to occur quite early and may remain indefinitely. Resolution of a large burn area can occur with the entire area involved first filling in with granulation tissue. This tissue then undergoes reorganization by stimulated odontoblasts with resultant reparative dentine formation. However, if healing is not successful, a large expanding abscess will develop[12].

LASER SAFETY MEASURES[13]:

a. Training of operators and personnel working on or near lasers (on site or general).

b. Posting and labeling of rooms and equipment, to include a warning light in the hallway or access entrance.

c. Protective eyewear and clothing.

d. Engineering controls such as beam stops, curtains, and enclosures.

The exact combination of these control measures depends on the power and type of laser, laser environment and procedures conducted with laser equipment.

• Eye Protection is important for the operator, staff, and the patient. Different lasers require different safety glasses.

- CO2 laser protection can be afforded with clear safety glasses, such as those that are normally worn during dental procedures. The patient wears clear safety glasses as well and as a back up measure, wet gauze sponges are placed over the patient eyes.

- For protection from Nd: YAG laser energy, both the doctor and staff need to wear green safety glasses.

- For the argon laser, orange safety glasses.

It is very important that all anesthetic gases be removed from the room. They are explosive, and could be ignited by a laser beam. The dentist must also suction off vaporized soft tissue, and the smoke, or laser "plume," emitted during procedures[14].

Instruments that are highly reflective or that have mirrored surfaces should be avoided, as there could be reflection of the laser beam.

Lasers are now part of our lives in many ways. They are in our computer printers and compact disc players, they light up rock concerts, and they guide weapons and measure distances between planets. Lasers have also revolutionized many surgical procedures minimizing bleeding, swelling, scarring, and pain. And now they're beginning to blaze a new trail in Dentistry.

There are innumerable uses of lasers in Dentistry. Right from cast analysis to record maintenance, from diagnosis to treatment planning, from etching to debonding, from increasing rate of tooth movement to controlling growth, from welding to painless removal of inflamed tissues anything could be achieved by using laser technology.

Careful understanding of the uses of lasers can result in painless, faster, easier and better treatment. Along with it's numerous and ever growing uses the clinicians should also have knowledge about their disadvantages, hazards and more importantly safety measures. Without this knowledge dentists can indirectly cause more damage to their patients than good.

We the dentists should balance our eagerness to apply these promising new tools with an appropriate measure of caution. The relatively high cost of laser systems will undoubtedly limit the extent of their implementation. Laser therapy is a potent but emerging science which opens a very promising path for investigation that may lead to revolutionary changes in the field of Dentistry[13,14].

The continued development of dental lasers helps dentistry to provide the best care for our patients. The science surrounding dental lasers continues to support their current use and shows promise for future applications of lasers in dentistry. Safe use of lasers also must be the underlying goal of proposed or future laser therapy. With the availability and future development of different laser wavelengths and methods of pulsing, much interest is developing in this growing field[15].

Despite the slow evolution of lasers in dentistry, researchers say the day will indeed come when a variety of lasers play a more prominent role in maintaining a healthy mouth. And it won't be just one laser that will do all dental procedures. Researchers are envisioning a laser unit in which you can switch on or off different types of lasers depending upon the procedure[15].

The past several years have seen rapid advances in laser technology especially in size reduction, cost effectiveness, simplicity of operation and safety. However, a large gap will exist for sometime before the lasers can evolve to meet some of the demanding requirements of safe, routine intra-oral use.

Source of Support: Self.

Conflict of Interest: Nil

Ethical approval: Not applicable

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The Efficiency of Conducting Pregnancy Session toward Reducing the Level of Anxiety to Deliver Baby

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ABSTRACT

Background: Maternal mortality rate has a significant implication on the success level of health effort on various levels. Approaches have been developed to ensure the availability of excellent health service quality as well as its accessibility to the community. One of such access towards the health improvement is pregnancy class, on which woman, who had 20 -32 weeks of pregnancy given accesses to knowledge related to antepartum to postpartum. This research was aimed to study the pregnancy class efficiency on mothers' level of anxiety to face childbirth in Pahandut Community health center, Central Kalimantan, Indonesia.

Method: The study was quasi-experimental with concurrent embedded designs. The population is mothers with a pregnancy period of 24-26 weeks, and get antenatal care at the Pahandut Health Center, with or without participation in classes of pregnant women. The sample was 30 pregnant women who were 24-26 weeks' gestation. The sample was determined using quota sampling. To assess anxiety level, the Hamilton Anxiety Rating Scale (HARS) scale was employed. Data were analyzed using independent t-test.

Results: The results showed that pregnant women who were given class treatment for pregnant women had an anxiety level score (8.77; 95% CI 7.64 - 9.89) lower than the anxiety level score (15.5; 95% 12.41-14,59) pregnant women who are not.

Conclusion: The pregnancy session class applies to assign to women before delivering birth, so they don't experience a high level of anxiety when delivering the babies.

Keywords: *Pregnancy class, Anxiety level, Childbirth.*

INTRODUCTION

The success of maternal health efforts, among which can be seen from the indicator of Maternal Mortality Rate (MMR). The decline in MMR in Indonesia occurred from 1991 to 2007, from 390 to 228. However, the 2012 IDHS showed a significant increase in MMR, which was 359 maternal deaths per 100,000 live births. The MMR again showed a decline to 305 maternal deaths per 100,000 live births based on the results of the 2015 Intercensal Population Survey [(1).]

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Strategies that can be carried out to improve access and quality of health services for mothers, newborns, and children, are carried out using the continuum of care approach starting from pre-pregnancy, pregnancy, childbirth, infants, toddlers, to adolescents (men and women of age fertile). During pregnancy, the program is intended to maintain the health of the mother and fetus in the womb, and if there are complications or risk factors can be detected early and intervened [(2)].

Pregnancy and childbirth are physiological processes and cause pain. Some pregnant women who feel pain during labor are affected by feelings of panic and stress. Mothers' fears of birth are related to maternal emotions that affect the delivery process. Labor anxiety is an unpleasant feeling or psychological condition due to physiological changes that cause instability in

mental states. To eliminate stress, cooperation must be planted between patients and health workers [3]. One of the efforts made so that pregnant women are ready to face childbirth is through classes of pregnant women. Class of pregnant women is a study group of pregnant women with a gestational age between 20 weeks to 32 weeks with a maximum number of participants of 10 people. Through class, pregnant women are expected to increase the knowledge and skills of mothers regarding pregnancy, care for pregnancy, childbirth, postpartum care, newborn care, myths, infectious diseases and birth certificates [4]. With assistance during pregnancy through classes, pregnant women are expected to reduce anxiety, fear of childbirth so that the processes can run smoothly and do not experience complications.

Based on the health profile of Palangka Raya City, in 2015 the number of cases of maternal deaths was 3 cases. The number of cases of maternal death slightly decreased compared to 2014 as many as 4 examples. The cause of maternal death in 2015 was due to bleeding and co-morbidities in the mother (asthma and heart). The community health center with maternal mortality cases were Pahandut Health Center, Panarung Health Center and Kereng Bangkirai Health Center, each with 1 case [5]. The Pahandut Health Center is one of the basic emergency obstetric services and inpatient health centers, one of which serves delivery assistance and has many targets for pregnant women. The health center has implemented a class program for pregnant women conducted in the community health center room which is prepared to facilitate the activities of the pregnant women. Thus, the research was aimed to study the effectiveness of the class among pregnant women on reducing the level of anxiety facing childbirth.

METHODOLOGY

This research is a quasi-experimental study, which aims to analyze the class effectiveness of pregnant women on the level of anxiety facing delivery of pregnant women in the working area of Pahandut Health Center. The population in this study were all pregnant women who were 24-26 weeks gestational age and received antenatal care at the Pahandut Health Center in April 2017. Case samples in this study were 30 pregnant women who were 24-26 weeks gestational age and received ANC and attended classes for pregnant women at least 4 times. The control sample was 30 pregnant women 24-26 weeks gestational age getting antenatal services at least 4 times but not taking classes for pregnant women. The sample selection was chosen using quota sampling [6] . The instrument for assessing variables in this study using an anxiety questionnaire refers to the Hamilton Anxiety Rating Scale (HARS) scale. Data analyzed using independent t-test. Normality and homogeneity employed Shapiro-Wilk, and Levene tests.

RESULTS

Based on the results of the study, many pregnant women were not at risk, in the treatment group at 80% (24) and the control group at 76.7% (23). In the treatment group amounted to 90% (27) pregnant women with primary and secondary education and in the control group amounted to 96.7% (29) pregnant women were with primary-secondary education. The employment status of pregnant women in the treatment group who did not work was 86.7% (26) and in the control group who did not work 60% (18). The results of the study are shown in Table 1 below:

Table 1. Sample characteristics in control and treatment

Variable	Treatment		Control	
	n	%	n	%
Age group risk				
No Risk	24	80	23	76,7
Risk	6	20	7	23,3
Education level				
High	3	10	1	3,3
Elementary - Secondary	27	90	29	96,7
Occupation				
Working	4	13,3	12	40
Not Working	26	86,7	18	60

The level of anxiety of pregnant women in the control group (not given a class intervention of pregnant women), is 8 the lowest and 23 the highest. The average rating of anxiety level in the control group was 14.13, with a standard deviation of 3.76. Using a 95% confidence level, the anxiety level scores in the population that were not given a class intervention of

pregnant women (control group) were between 12.73 – 15.54.

The anxiety level of 30 pregnant women in the treatment group before being given a class intervention of pregnant women was 4 the lowest score and 24 the highest. The average rating of anxiety level in the treatment group was 12.03, with a standard deviation of 5.41. Using a 95% confidence level, the anxiety level score in the population is between 10.01 – 14.06.

Table 2. The level of the anxiety of pregnant women before intervention

Groups	n	Min – Max	Mean	SD	95% CI Mean
Control	30	8 – 23	14.13	3.76	12.73-15.54
Treatment	30	4 – 24	12.03	5.41	10.01-14.06

The level of anxiety of pregnant women in the control group (not given a class intervention of pregnant women), the lowest score of 9 and the highest score of 19. The average rating of anxiety levels in the control group was 13.5, with a standard deviation of 2.91. Using a 95% confidence level, researchers believe that anxiety level scores in the population not given class intervention by pregnant women (control group) between 12.41 – 14.59.

The anxiety level of 30 pregnant women in the treatment group after being given class intervention of pregnant women, the lowest score was 3, and the highest score was 15. The average rating of the anxiety level in the treatment group after being given classes of pregnant women was 18.77, with a standard deviation of 3.01. Using a 95% confidence level, researchers believe that anxiety level scores in the population after being given a class intervention of pregnant women between 7.64 - 9.89.

Table 3. The level of the anxiety of pregnant women after intervention

Group	N	Min – Max	Mean	SD	95% CI Mean
Control	30	9 - 19	13.5	2.91	12.41 – 14.59
Treatment	30	3 – 15	8.77	3.01	7.64 – 9.89

Classes of Pregnant Women Against Differences in Anxiety Levels of Mother Facing Labor

The results of this study found that pregnant women who were given class treatment for pregnant women had an anxiety level score (8.77; 95% CI 7.64 - 9.89) lower than the anxiety level score (15.5; 95% 12.41 - 14.59) pregnant women who are not given class treatment for pregnant women.

Table 4. Comparisons between level anxiety facing childbirth between two group

	Mean Skor (95% CI)	SD	Levene Test	Difference 95% CI	P -Value
Level of anxiety control (n=30)	13.5 (12.41 – 14.59)	2.91	0.934*	4.73 (3.2 – 6.26)	0.005
Level of anxiety intervention (n=30)	8.77 (7.64 – 9.89)	3.01			

Remarks :

Normality test: *Shapiro Wilk*; Homogeneity test: Levene test.

Table 5. Score comparisons before and after of anxiety level on the treatment group

	Mean Skor (95% CI)	SD	R	difference 95% CI	P- Value
Level of anxiety before treatment (n=30)	12.03 (10.01-14.06)	5.41	0.446[a]	3.26 (1.44 – 5.09)	*0.001*
Level of anxiety after treatment (n=30)	8.77 (7.64 – 9.89)	3.01			

The average score of the level of anxiety of pregnant women before pregnancy classes were 12.03 with 95% confidence interval 10.01 to 14.06. Meanwhile, after the intervention, the average anxiety level score was 8.77 with a 95% confidence interval of 7.64 to 9.89. The difference in the value of anxiety of pregnant women after treatment was a decrease of 3.26, with a 95% confidence interval of 1.44 to 5.09. There is a difference in the average score of anxiety levels before treatment and after treatment value <0.05.

The results showed that there were differences in scores on the level of anxiety of pregnant women before and after being given classes for pregnant women. With a significant value of 0.001 (<0.05). The cooeficient of determination value is 19.8% indicating that the class of pregnant women plays a role of 19.8% in decreasing anxiety level scores, while other factors cause the rest.

DISCUSSIONS

The results of the study showed that the age of respondents mostly not at risk as many as 46 people (76.6%). Since maternal age determines physiological and psychological status during pregnancy and childbirth, the age of 20-35 years is the optimal or safe reproductive age to undergo pregnancy and childbirth [7]. In Table 1, the results showed that most of the respondents' education level was elementary-secondary education as many as 56 people (93%). Education is a basic need that is very much needed for self-development and intellectual maturity. Education can also instill a real understanding that changes the mother's personality. The coping mechanism is more consistently formed and modified due to the right adaptive response to maternal anxiety [6]. The results showed that most of the mothers did not work (homemakers), namely 44 people (73%). Work is a busy life that must be done primarily to support their lives and family life. In general, mothers who work their time-consuming activities can distract anxiety. However, mothers who work can also eliminate feelings of fear because of the attention and support of their husbands and families.

This study found that pregnant women who were given class treatment for pregnant women had an anxiety level score (8.77; 95% CI 7.64 - 9.89) lower than the anxiety level score (15.5; 95% 12.41-14, 59) pregnant women who are not given class treatment for pregnant women. These results indicate that by following the implementation of the maternal class, the level of anxiety of pregnant women is lower in the face of childbirth. This is because, the course of pregnant women aims to increase knowledge, change maternal attitudes and behavior so that they understand about prenatal care so that mothers and fetuses are healthy, childbirth is safe, delivery is comfortable, mothers are safe, babies are healthy, prevention of physical and mental illness, nutritional disorders and complications pregnancy, and childbirth so that mothers and babies are healthy, care for newborns so that optimal growth and development, and physical activity of pregnant women. Maternal class activities help in carrying out pregnancy, be ready to face childbirth and childbirth safely, comfortably, healthily and safely similar to previous findings [8,9].

Anxiety can arise from a person's reaction to pain that will increase the activity of the sympathetic nerve and increase catecholamine secretion. Excessive catecholamine secretion will cause a decrease in blood flow to the placenta so that it limits oxygen supply and decreases the effectiveness of uterine contractions which can slow the labor process.

The results also found that pregnant women after being given the class treatment of pregnant women scores lower anxiety levels compared to scores of anxiety levels of pregnant women before being given the class treatment of pregnant women [10].

As suggested [11], it is essential for pregnant women to get information about the process of pregnancy, baby care and self-confidence in preparing to be a parent. Through the classes of pregnant women, health workers are more aware of the health problems of pregnant women and their families and are closer to pregnant women family and community making the mother is ready to undergo pregnancy and face childbirth [4].

CONCLUSION

Pregnant women who are given class treatment scores lower in anxiety levels compared to the rating of those who are not given class treatment. Also, pregnant women after being given the class treatment score lower in anxiety levels compared to scores of anxiety levels of pregnant women before being given the class treatment of pregnant women.

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University, Bandung, Indonesia.

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Determination of the Safe Duration of Benzene Non-Carcinogenic Exposure in Motor Workshop Area

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ABSTRACT

Workers in motor workshop area who working more than 3 years were at risk of exposure to benzene from improved emissions of vehicles in their work environment. The objectives of this study were to measure the duration of safe exposure to benzene in the work environment of motor workshops and to know Risk Quotient (RQ) due to exposure to benzene (non-carcinogenic).

This type of research was an analytical study by using Environmental Health Risk Analysis design, which was used to assess and predict what would happen due to hazardous substances exposure. In this case, benzene was used as one component in fuel oil. The sample population was 15 people from all workers in a motor workshop area in Surabaya. Data analysis was using manual data calculation to know the benzene intake, the Risk Quotient (RQ) on worker and the duration of safe exposure of benzene in motor vehicle workshop area.

It was found that the average intake of benzene in motor workshop area in Surabaya was 0.01631 mg/kg/day, the average of RQ was was 1.91882 mg/Kg/day or RQ>1, indicating that workers in motor workshop area had health risk due to benzene exposure) and the safe duration of benzene exposure for workers in the motor workshop area was 5.43 years. Therefore, it was necessary to control the work environment to reduce effect of the benzene exposure on workers. It was concluded that workers in the motor workshop area were at a risk of benzene exposure but could work safely for 5.43 years. It was depend on the food intake and the condition of each body of workers in the motor workshop environment. Recommendations were by consuming CYP2E1 enzyme contained in cow liver and salmon to lower benzene levels in the body.[8]

Keywords: *Benzene, Risk Quotient, Safe Duration, Workers, Motor Workshop*

INTRODUCTION

Everyone can be exposed to small amounts of benzene every day. Benzene exposure can occur in workplace, outside environment or at home. The main sources of benzene are cigarette smoke, motor vehicle emissions and emissions of industrial activities. Motor vehicle emissions produce Benzene, Toluene and Xylene (BTX) which are carcinogenic chemicals. One of the places that has a lot of motor vehicle emissions is motor workshop area. Workers in motor workshop area who working more than 3 years were at risk of exposure to benzene from improved emissions of motor vehicles in their work environment.

BTX is a Volatile Organic Compound (VOC), a carbon-containing compound that has a high vapor pressure at room temperature. The most commonly known VOCs are solvents, and other VOCs are widely used such as monomers and fragrances.[12] BTX is a chemical classified as toxic to health, whether carcinogenic and increases oxidative stress.[2,3,9,14] Besides BTX non-carcinogenic can affect the hematopoietic system, central nervous system and reproductive system.

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The toxic nature of BTX in high-level exposure leads to neurotoxic symptoms. Continuous exposure in high levels of BTX can affect damage to the human bone marrow, DNA in mammalian cells and immune system. Light exposure of BTX causes irregular heartbeats, headaches, dizziness, nausea and even fainting if the exposure continued for a long time. Early manifestations of its toxicity are anemia, leukocytopenia, and thrombocytopenia.[11]

Benzene as one member of BTX is a compound that is non polar because it does not have a pair of free electrons. The chemical structure of benzene has 3 double bonds. The existence of double bonds on benzene makes this compound harmful to humans and other living things because it is carcinogenic. Benzene is non polar compund that insoluble in water, but soluble in organic solvents such as diethyl ether, carbon tetrchloride or hexane.[1] Benzene is an aromatic hydrocarbon compound having an enclosed carbon chain with 6 hydrogen atoms having unsaturated properties with C6H6 chemical formula.

Several agencies in the field of health and safety such as WHO (World Health Organization), and the Agency for Toxic Substances and Disease Registry (ATSDR) have determined that Benzene is a substance that can cause cancer. In addition, acute effects can be eye irritation, respiratory tract, dizziness and loss of consciousness.[1] The Indonesian government through the labor department has categorized Benzene as carcinogenic according to Permenakertrans No.13/ MEN/X/2011 in 2011.[7]

The results of Haen and Oginawati[4] showed that there is a significant relationship between benzene concentration in breathing zone with hemoglobin, erythrocytes and also eosinophils. It could be related to bone marrow, because the formation of blood cells occurs in the bone marrow. Robbins and Kumar said that benzene can cause myeloid stem cell failure resulting in reduced production of hemoglobin and red blood cells. If red blood cell deficiency occurs for a long time, it can cause aplasti anemia.[10] A study conducted by Lan et al in 2004 concluded that in benzene-exposed workers with relatively low concentrations (<1 ppm) there was a haematological effect. In the study also found that benzene exposure also has a significant relationship with eosinophils. The number of abnormal eosinophils is one of the hematopoetic disorders that can cause eosinophilia. Eosinophilia is a response to a disease. If a foreign material enters the body it will be detected by lymphocytes and neutrophils, which will release the material to attract the eosinophils to the area. Then eosinophils will release substances that can kill parasites and also destroy abnormal cells.

Based on the research previously about benzene in work environment, those have not been conducted research about safe duration (Dt Safe) for workers to work safely in work environment that has benzene exposure yet. Motor workshop area as the work environment that has benzene exposure, the workers and the owner of motor workshop have safe duration for wokers to work safely in motor workshop area. This is done to prevent health problems (non-carcinogen) caused by benzene exposure.

Therefore, based on the explanation above, we would like to measure the safe duration of benzene (non-carcinogen) in motor workshop area and to know workers characteristic, concentration of benzene exposure, respiration rate, intake and Risk Quotient (RQ) of benzene exposure (non-carcinogen).

MATERIAL AND METHOD

This type of research was an analytical study by using Environmental Health Risk Analysis design, which was used to assess and predict what would happen due to hazardous substances exposure. In this case, benzene was used as one component in fuel oil.

The design of study started from collecting secondary data that related to the work process which included the concentration of benzene in the air and the number of operators involved. Moreover, the study conducted primary data collection that associated with operators weight, exposure time, exposure frequency and exposure duration of benzene chemicals.

The sample population was 15 people from all workers in a motor workshop area in Surabaya with age between 19 years until 46 years and work period from 7 months until 20 years. Data analysis was using manual data calculation to know the benzene intake, the Risk Quotient (RQ) on worker and the duration of safe exposure of benzene in motor vehicle workshop area. Measurements of Benzene concentrations in the work environment were carried out using Minipump and Carcoal sample media. The reference used was NIOSH

1501 sampling and analysis.

The data was obtained through primary data by filling out questionnaires about age, weight and working period. Data of complete blood examination on respondents and benzene exposure in the workplace assisted by experts which is nurses from UPTK3 Hiperkes in East Java, Indonesia.

The variables studied were workers characteristics (age, weight and working period), concentration of benzene exposure, respiration rate, intake, Risk Quotient (RQ) and safe duration (Dt Safe) of benzene exposure (non-carcinogenic) in motor workshop area. Data analysis in this study was conducted by using quantitative data analysis to determine the concentration of safe exposure of Benzene to workers.

FINDINGS

A) Workers Characteristics

The workers characteristics in this study included age, weight and working period of 15 worker respondents in motor workshop area. Based on Table 1. in weight distribution, it was known that the most weight group of workers was group 54-62 Kg as much as 6 respondents (40,0%), while the highest weight of 78 Kg and the lowest weight of 45 Kg. In age distribution, it was known that the largest group of workers was aged between 19 years to 25 years as many as 7 respondents (46,7%), and groups of workers with age between 40 to 46 years was at least 2 respondents (13.3%). In working period distribution, the working period of the worker respondents was categorized into two that was the working period less than 3 years and the working period more than 3 years. It was known that the largest group of workers had working period more that 3 years in motor workshop area as much as 9 respondents (60,0%).

Table 1. Distribution of Workers Characteristics in Motor Workshop Area

Workers Characteristic		N	%
Weight (Kg)	45-53	5	33.3
	54-62	6	40.0
	63-71	3	20.0
	72-80	1	6.7
Total		15	100.0
Age (Years Old)	19-25	7	46.7
	26-32	3	20.0
	33-39	3	20.0
	40-46	2	13.3
Total		15	100.0
Working Period (Years)	<3	6	40.0
	≥3	9	60.0
Total		15	100,0

***Cont...* Table 1**

B) *Concentration of Benzene Exposure*

Based on the measurement of benzene concentration in Table 2., the result of concentration of exposure centered on reparation section of motor workshop with benzene level concentration was 0,3974 ppm.

Table 2: Measurement of Concentration of Benzene Exposure in Motor Workshop Area

Measurement Location	Benzene Level (ppm)
Reparation Section of Motor Workshop	0.3974
Administration Section of Motor Workshop	-

Based on the measurement results by Balai Hiperkes Surabaya, the concentration of benzene in the motor workshop area was 0.3974 ppm or 1.267 mg/m^3. The Concentration of Benzene was above the Minimum Risk Level (MRL), level of benzene inhaled exposure assigned by ATSDR[1], for acute exposure (≤14 days) = 0.009 ppm, moderate exposure (15-364 days) = 0.006 ppm, and chronic exposure (≥365 days) = 0.003 ppm. The concentration of benzene based on TLV value specified in Peraturan Menteri Tenaga Kerja dan Transmigrasi Nomor Per.13/MEN/X/2011 in 2011 about Threshold Limit Value (TLV) of physical factors and chemical factors in workplace, it was still below the TLV (1.59 mg/m^3).[7]

C) *Respiration Rate*

Based on the calculation of the respiration rate on the worker respondents, the highest respiration rate of workers was 0.69 m^3/hour, the lowest respiration rate of worker respondents was 0.55 m^3/hour and the average respiration rate of worker respondents was 0.61 m^3/hour.

D) *Intake*

The formula used to determine the intake of benzene toxin in the body is:

Notes:

$$Intake \text{ Benzene Non} - \text{Carcinogen} = \frac{\text{C x R x tE x fE x Dt}}{\text{Wb x Tavg}}$$

C = Benzene Concentration (mg/m^3)

R = Respiration Rate (m^3/hour)

t_E = Time of exposure (hour/day)

f_E = Frequency or Average exposure in year (day/year)

Dt = Duration of Exposure (year)

W_b = Weight (Kg)

T_{avg} = Average Exposure of Benzene (non-carcinogen)

→ 30 years x 365 day/year

Table 3. Intake, Risk Quotient (RQ) and Safe Duration (Dt Safe) of Benzene Exposure (Non-Carcinogenic) in Motor Workshop Area

Respondents	Benzene Intake (mg/Kg/day)	Risk Quotient (RQ) (mg/Kg/day)	Safe Duration (Years)
1	0.00807	0.94941	5.43
2	0.00797	0.93764	5.43
3	0.04197	4.93764	5.43
4	0.00148	0.17411	5.43
5	0.00175	0.20588	5.43
6	0.00920	1.08235	5.43
7	0.01238	1.45647	5.43
8	0.03319	3.90470	5.43
9	0.00760	0.89411	5.43
10	0.00960	1.12941	5.43
11	0.00269	0.31647	5.43
12	0.01050	1.23529	5.43
13	0.02169	2.55176	5.43
14	0.04798	5.64470	5.43
15	0.02867	3.37294	5.43
Average	0.01631	1.91882	5.43

It was known that the exposure concentration (C) was 1,267 mg/m^3, the frequency or average exposure (f_E) of Benzene was 288 days/year and the average exposure of benzene (non-carcinogenic) (T_{avg}) was 30 x 288 days. Table 3 below describes the results of Intake Benzene calculations on workers, Risk Quotient (RQ) and Safe Duratin (Dt Safe) in the work environment. It was known that the maximum intake received by the worker is 0.04798 mg/Kg/day.

The intake value is directly proportional to the chemical concentration value, the frequency of exposure, and the duration of exposure, which can be interpreted the greater the value the greater the intake of a person. Intake is inversely proportional to the weight value, ie the greater the weight the smaller the health risk.

E) *Risk Quotient (RQ)*

The formula used to calculate the RQ is:

$$Risk\ Quotient\ (RQ) = \frac{Intake}{RfC}$$

The risk characteristics are intended to determine whether a toxin exposure has a risk or not to the human body. Risk Quotient (RQ) is the result of comparison between the value of Intake with reference dose of a Reference of Concentrate (RfC) exposure. The RfC value for benzene based on US-EPA was 0,0085 mg/Kg/day.[13] Based on the calculation data in Table 3., it was known that the RQ in the average worker was 1.91882 mg/Kg/day and the highest RQ was 5.64470 mg/Kg/day. This showed that the exposure of benzene to workers motor workshop area had a risk of health problems. Based on the data distribution, there were 9 worker respondents with high risk of health disorder (RQ>1) and 6 worker respondents with RQ<1. This was known that most of workers have potential health problems from non-carcinogenic effects of benzene exposure in motor workshop area.

There is actually no value for the lowest safe limits on exposure to these chemical compounds to risk leukemia at all exposure levels. WHO warns that any benzene exposure of 1 pg/m^3 would have an additional 4 to 8 cases of leukemia per million population during life.[6] The IARC stated that hematologic neoplasms such as myelogenous acute leukemia have been documented to occur at chronic exposure with low concentrations (10 ppm).[5]

Safe Duration (Dt Safe)

Safe Duration (Dt Safe) is safely associated with duration at work for a day and duration (in years) to work. It is important to set Dt safe in the workplace because it is related to safety. Determinants for safe duration involve good work rotation and ventilation in the workplace if working in a workplace that is chemically related. The formula used to calculate the safe Dt is:

Based on the calculation data in Table 3., it was known that the safe duration of worker respondents for work was 5.43 years. It means the worker in motor worksop area could work safely for 5.43 years depending on food intake and body condition respectively.

CONCLUSION

It was concluded that workers in the motor workshop area were at a risk of benzene exposure (non-carcinogenic) but could work safely for 5.43 years. It was depend on the food intake and the condition of each body of workers in the motor workshop environment. Recommendations were by consuming CYP2E1 enzyme contained in cow liver and salmon to lower benzene levels in the body.[8]

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A Short Review about Electrophysiology and Bioimpedance: History and Perspectives

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ABSTRACT

During the 18th century, in the scientific world emerged two personalities that greatly influenced medicine and science: Luigi Galvani e Alessandro Volta.

The theories and inventions of these scientists were the starting point for the knowledge of excitable tissue physiology and for the development of electrical and electronic instruments that are now widely used in the biomedical field, such as the ECG and biomedical chips. Currently, different tecniques are available for different patients and scopes, but some issues regarding both hardware and software need to be solved, for example electrode position, spatial resolution and, moreover, standardization of reference values for specific populations and conditions.

The purpose of this short review is to highlight how Volta's and Galvani's studies allowed the development of impedenziometric instruments, which are increasingly used for non-invasive diagnostics in many health and illness conditions.

Keywords*: Electrophysiology, Bioimpedenziometric Analysis (BIA), Virtual biopsy, History of medicine*

THE ORIGINS OF ELECTROPHYSIOLOGY

Luigi Galvani (1737-1798) was an anatomist and physiologist physician that discovered the "*animal electricity",* and his observations opened to the electrophysiology. He exposed his theories in the "*De viribus electricitadis in motu musculari commentarius*" (meaning "Commentary on the forces of electricity in the muscular movement") based on the observation that the stimulation of a nerve causes the contraction of the associated muscle in frogs, demonstrating that in animal tissues exist bioelectric forces. [1,2]

Alessandro Volta (1745-1827) was a physics and the inventor of the battery. Jean François Dominique Arago, a french physics and astronomist (1786-1853), in his eulogy of Alessandro Volta defined the electric battery as "*il più maraviglioso strumento che mai fosse inventato dagli uomini, senza eccettuare il telescopio e la macchina a vapore*" (that means: "the most wonderful instrument created by the mind of men, even not excluding the telescope or steam engine") [3]

Because the discoveries of the two scientists were in contrast with the standard scientific models of the time, they did not succeed. A famous, strong polemic debate between Volta and Galvani began in 1792. Thanks to the theoretical dispute that they provoked at that time within their contemporary scientific community, they stimulate a number of researches and applications in physics and biomedicine leading to several biomedical applications, much of them has been developed during the 20th century[4].

At that time, a protagonist of the debate on medical science was John Brown (1735-1788), a professor at the Scottish University of Edinburg, that exposed his

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neuropathology theory and the concept of "*excitability*" in his "*Elementa Medicinae*". Excitability was a kind of vital force within the brain and neuromuscular fibers, defined as the basic quality of living matter and consisting in receiving stimuli from the outside and to react to them. According to this theory, health would be determined by a balance between external stimuli and excitability, while diseases should be attributable to a deficiency in stimulation intensity [5]. Such idea recall the theories of Epicurus and moreover Asclepiades about the modification of the health status based on the equilibrium of atoms and their reciprocal distances [6].

Another protagonist of the time was the swiss Albrecht von Haller (1708-1777), who was professor of anatomy, surgery and botany at University of Göttingen. His research was also focused on the nervous system, whose knowledge at the time was limited to the effects of nerve resection and cortical lesions, thinking that the nervous system was governed by vital spirits that, through the "*phlegma*", circulates from the brain to the spinal cord and reach the nerves of the entire body through thin tubules. He performed a series of animal experiments, observing that mechanical, electrical, or chemical stimulation induced contraction in some areas of the body and pain in other. Based on these results he subdivided body structures into two groups: the irritable ones found in muscles, and the sensitive ones identifiable with the nerve fiber. These intuitions leaded to fundamental discoveries in neurology from the beginning of the new century up to our time [7].

Electrophysiological studies and clinical practice

The discoveries of electrical activity of human body, as well as its conductivity and resistance to the passage of electric waves in cells and tissues, allowed to point out a large series of technical instruments used in daily clinical practice. For example, electrocardiography (ECG), electroencephalography (EEG) and bioimpedenziometric analysis (BIA) are communly used to evaluate the health status and clinical conditions of millions of people worldwide.

The first ECGs were recorded in 1880 by Augustus Desirè Waller in human and animals adapting some capillary electrodes, although artifacts were possible due to noise interferences from the environment [8,9]. Clinical application in humans became widely possible at the beginning of the 20th century, thanks to the availability of new sensitive electric galvanometers allowing to record, non invasively, the micropotentials generated during heart activity. An important contribution for the ECG evolution was the confirm of the existence of cell membranes by Höber, which also calculated their thickness by bioimpedance [10-12].

Bioimoedance (BIA) affirmed its utility for the determination of body composition during the 80s of the 20th century [13,14]. Such test was based on a large number of experimental and clinical studies started by Thomasset and others [15-18].

After these pionieristic studies the BIA has been widely used to assess the nutritional status in both healthy subjects (e.g., children, sportsmen, pregnant women, etc.) [19-23], also comparing such technique with other well established (i.e., skinfold measurement) [24], and patients with various different clinical conditions (e.g., obesity, sports injuries, etc) [25-27].

The first studies about the electrical impedance of the human body started in the late 1950s, when Nyboer devised a technique for the study of blood flow based on impedance measurement, based on the principle that changing the conductive volume, an alteration of the impedance of the conductor is constantly observed [28,29].

The conceptual basis of the the BIA is that the human body is an electrical circuit enclosed within a cylinder, whose volume is obtained additioning the volumes of arm, trunk and legs. It is possible assuming that human tissues have different conductivity depending on specific features of the body districts [30,31].

CONCLUSION

During the last decades, a number of impedenziometric systems have been developed to obtain non invasive devices for rapid diagnosis and monitoring of common conditions, also obtaining a tomographic analisys of specific districts [32-35].

Such instruments are possible alternative tools for a wide range of clinical problems and have been applied in different fields as surgery, hepato-gastroenterology and oncology [36-39], pneumology and cardiology [40-44], nephrology [45-51], as well as for HIV [52-53]. More recently, some authors have reported the possibility of performing electronic biopsies for diagnosis of cancers, but only a few paper are dedicated to the possible use of bioimpedance to differentiate preneoplastic lesions and

cancers [54-55].

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The Use of IUD, Passive Smoker and the Risks of Cervical Cancer: A Cross-Sectional Study at Female Workers in Surabaya City, Indonesia

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ABSTRACT

Background: The number of cases of cervical cancer in the world increased every year. IUD users also increased as they feel more secure using IUDs. The purpose of this study was to determine the level of cervical cancer risk for IUD users.

Method: The research method was cross sectional study. Total respondents were 11 people who were career women with 6 respondents of IUD users and 5 respondents were not users of IUD. Cervical cancer risk test used IVA method. Independent variables studied were IUD users, passive smokers The dependent variables studied were cervical cancer risk through IVA status and IUD aging complaints.

Result: Based on the results of the study, IUD users had a cervical cancer risk of 3.33 times compared to non-IUD users, IUD users always bleed 2.125 times compared with non-IUD users. IU-female passive smokers bleed 1.5 times compared with non-IUD users.

Conclusion: The conclusion of this study was that IUD can cause cervical cancer risk. Passive smoking can warn of cervical cancer risk.

Keywords: *IUD, Cervical Cancer, Passive smoker.*

INTRODUCTION

Cancer has become a global problem. According to the World Health Organization (WHO) in 2012, there are 14 million new cases and 8.2 million people died from cancer. Cervical cancer and breast cancer is a disease with the highest prevalence in Indonesia with 0.8 ‰ and 0.5 ‰ [12]. Every year there are about 15 thousand new cases of cervical cancer in Indonesia. WHO placed Indonesia as the country with the largest number of cervical cancer patients in the world. Cervical cancer also ranked first female killer in Indonesia. According to data Balitbang Ministry of Health in 2013 there are 347.792 people or about 1.4 ‰ of the total population of Indonesia suffering from cancer [6].

From various research reports, cervical cancer is closely related to the use of Intra Uterine Device (or hereinafter abbreviated as IUD). The results of the research by Sipra Bagchi, et al, about the effect of 33% of IUD users with 33.7% Cu have not been normal for cervical cytology to lead to cervical cancer [7]. Based on research by Lassise DL, et al (1991) on Invasive cervical cancer and intra uterine device use, the use of IUD contraceptives can increase the incidence of cervical cancer since the introduction of IUDs in the early 1990s[1].

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Research has been conducted by U. J. Koch on the effects of copper lUDs on cervical cytology and influences on trans-migration sperm migration, concluded that all IUDs acting as foreign bodies in the intrauterine cavity caused a sterile inflammatory response to the endometrium as long as the IUD remained [11]. This reaction is similar to other foreign body reactions. The typical symptoms of this reaction are leukocytosis in the fluid cavity of the uterus and cervix. Based on the results of the research Lekovich's, et al, on the Comparison of Human Papillomavirus Infection and Cervical Cytology in Women Using Copper-Containing and Levonorgestrel-Containing Intrauterine Devices against 36 IUD users found vaginal cleansing 70% of respondents containing copper with 95% confidence level (CI) 53.6 - 86.4% [2].

Based on research results Onur, et al, on the impact of copper-containing and levonorgestrel-releasing intrauterine contraceptives on cervicovaginal cytology and microbiological flora: A prospective study that colonization by Candida spp. and mycoplasma infection was diagnosed significantly more frequently after one year of use of Cu-IUD than in the baseline [5]. During the study period, women taking Cu-IUD complained significantly more frequently with vaginal discharge, pelvic pain, and increased menstrual flow.

In addition to the use of IUDs, an increased risk of cervical cancer is also triggered by cigarette smoke. Cigarette smoke contains chemicals such as CO, Cd, benzene can increase stress in women and increase the number of free radicals in the body. In the home environment, women as passive smokers have a risk of stress due to the dangers of cigarettes [9]. Stress in women using IUD will increase the acidity of the vagina thus increasing the Cu corrosion that allows Cu to react with glutathione, as well as free radical reactions with DNA as a trigger for cervical cancer.

From the development of research on cervical cancer, which has not been done is a study that looks at how IUD users are at risk of developing cervical cancer by analyzing the chemical mechanisms in the body. Also, factors that may increase the risk of cancer for IUD users such as exposure to secondhand smoke. This study will assess the level of cervical cancer risk for IUD users. Also examined the effect of passive smoking factor with cervical cancer risk on IUD users.

MATERIAL AND METHOD

IUD cancer risk research used cross sectional method. The number of respondents 11 people consisting of 6 users of IUD and 5 people used other types of contraception. Respondents were career women working in both formal and infomal sectors. The variables studied include independent variables and dependent variables. The independent variables include the use of IUD, passive smoking and the habit of cleaning the sex organs. The dependent variables studied were cervical cancer risk through IVA status and IUD user complaints.

Methods of data collection by interviewing respondents to know the toxicity using IUD, status as a passive smoker and complaints that were felt like vaginal bleeding. Cancer risk is known by using IVA method. Data analysis used statistic method Odd Ratio. From Odd ratio method with 2 x 2 cross tabulation can be known level of cancer risk of respondents who use IUD as well as variables that have contribution increase cervical cancer risk that was status of respondent as passive smoker.

FINDINGS/ RESULTS

Based on the research method, the results of the research can be described below.

Relation of IUD usage with status IVA

Table 1. Relationship of IUD Usage with Status IVA

Using IUD	Status IVA		Total
	Positive	Negative	
Yes	4 (66,7%)	2 (33,3%)	6 (100,0%)
No	0 (0,0%)	5 (100,0%)	5 (100,0%)
Total	4 (36,3%)	7 (66,7%)	11 (100,0%)

From the table above those who used IUD after tested IVA 66.7% have a positive IVA compared with respondents who do not use IUD. Based on the results of Odd ratio analysis obtained value 3.33 means IUD users suffer cervical cancer risk 3.33 times compared with respondents who do not use IUD.

Table 2. Relationship of IUD Use with Vaginal Bleeding

Using IUD	Vaginal bleeding		Total
	Yes	No	
Yes	3 (50,0%)	3 (50,0%)	6 (100,0%)
No	0 (0,0%)	5 (100,0%)	5 (100,0%)
Total	3 (27,3%)	8 (72,7%)	11 (100,0%)

From the table above those who used 50% IUD mentioned frequent vaginal bleeding and complaints around the vagina, compared with those who did not use no IUD (0.0%) mentioning bleeding and complaints around the vagina. Based on the results of Odd ratio analysis obtained value of 2.125, means IUD users suffer risk of complaints and bleeding 2.125 times compared with respondents who do not use IUD.

Table 3. The relationship of Passive Smokers to Vaginal Complaints and Bleeding

Passive smoker	Vaginal bleeding		Total
	Yes	Sometimes	
Yes	1 (33,3%)	2 (67,7%)	3 (100,0%)
No	2 (25,0%)	6 (75,0%)	8 (100,0%)
Total	**3 (27,3%)**	**8 (72,7%)**	**11 (100,0%)**

In the table above IUD users who live with smokers' families so that they become passive smokers 33.3% say that experiencing complaints and bleeding in the vagina, while 25% of respondents who are not passive smokers experience complaints and bleeding around the vagina. Based on Odd Ratio analysis results obtained a value of 1.5 which means IUD users as passive smokers have a risk of vaginal bleeding 1.5 times compared with those who do not use IUD.

DISCUSSION

a. IUD and IVA

IUD users experienced a positive risk of IVA 3.33 times compared with respondents who did not use IUD. Material IUDs are composed of polyethylene and copper plastics. Planting IUDs in the cervix to prevent the entry of sperm cells into the female ovum. Copper includes positively charged and polar metals [9]. During menstruation the level of blood acidity will increase, so also when the woman stress the acidity level of blood will also increase. As the level of blood acidity increases it will be able to corrode copper so that copper can be corroded and dissolved in blood or fluid in the uterus.

Based on the results of Lekovich's research, et al, on the Comparison of Human Papillomavirus Infection and Cervical Cytology in Women Using Copper-Containing and Levonorgestrel-Containing Intrauterine Devices against 36 IUD users found vaginal cleansing 70% of respondents containing copper with 95% confidence level (CI) 53.6 - 86.4% [2]. From the results of this research indicates that the blood and the results of vaginal cleansing contain Cu which is the corrosion of Cu metal that is planted in the womb.

Cu can finally passively diffuse into the blood and is distributed to the body's cells including the cervical cells. Copper can eventually bind to glutathione in the body producing GSCu which causes a decrease in glutathione concentration in the body. Reaction mechanism as follows:

$$GSH + Cu^{+} \longrightarrow GSCu + H^{+}$$

Note: GSH = The formula of glutathione chemical compounds

Based on the results of Lekovich's research, et al, on the Comparison of Human Papillomavirus Infection and Cervical Cytology in Women Using Copper-Containing and Levonorgestrel-Containing Intrauterine Devices against 36 IUD users found vaginal cleansing 70% of respondents containing copper with 95% confidence level (CI) 53.6 - 86.4% [2]. From the results of this research indicates that the blood and the results of vaginal cleansing contain Cu which is the corrosion of Cu metal that is planted in the womb.

The decreasing of glutathione concentration in cervical cells causes decreased glutathione function in cervical cells. The occurrence of decreased glutathione function in the cervical cells will cause free radicals

(ROS), which every day to attack the body, including in the cervical cells, both entering through food, drink and air will be free to react with DNA in the cervical cells. Sehigga, causing DNA adduct in vaginal uterine cells as the forerunner of cervical cancer. The chemical reaction mechanism of adduct DNA is shown below:

ROS + DNA ⟶ DNA damage (cancer servics)

The chemical mechanism of cervical cancer due to Cu above is reinforced by several reports of cervical cancer IUD research results. Based on the results of Sipra Bagchi's research, et al, about the effect of 33% of IUD users with an unusual 33.7% Cu in cervical cytology to cervical cancer [7]. Based on the findings of Lassise DL, et al, on Invasive cervical cancer and intrauterine device use, the use of IUD contraceptives to increase cervical cancer has been considered since the introduction of IUDs in the early 1900s [1].

Based on research results published in the journal AKPERGSH LPPM Nursing Academy Giri Satriya Husada Wonogiri obtained research results that IUD users respondents 33.34% cervical cancer [3]. Based on the results of the study Octava Prima Arta, et al, published in the journal Nexus published by the Faculty of Medicine, State University of Sebelas Maret entitled "The Relationship between the Use of Intrauterine Device (IUD) and the incidence of Cervical Cancer in Dr.Moewardi Hospital" concluded that the users of IUD has a cervical cancer risk of 12.7 times compared with those not using an IUD [4].

b. IUD and Complaints and Bleeding

IUD users experienced the risk of complaints and bleeding 2,125 times compared with respondents who did not use the IUD. Materially, the IUD is composed of polyethylene and copper type plastic. Planting IUDs in the cervix to prevent the entry of sperm cells into the female ovum. However, with frequent friction-friction on the cervix so that menyehabkan inflammation and bleeding. Based on the results of Onur E, et.al, on the impact of copper-containing and levonorgestrel-releasing intrauterine contraceptives on cervicovaginal cytology and microbiological flora: A prospective study that colonization by Candida spp. and mycoplasma infection was diagnosed significantly more frequently after one year of use of Cu-IUD than in the baseline [5].

c. Passive Smokers With Bleeding

Based on Odd ratio analysis results obtained a value of 1.5 which means IUD users as passive smokers experience the risk of complaints and bleeding 1.5 times compared with those who do not use IUD. Passive smokers, ie people who do not smoke but have to inhale cigarette smoke. This condition can increase stress on them. This is because they are uncomfortable, stress is in one room with smokers.

In people who are increasingly stressed, it will cause their hormones higher cortisol which will affect the higher the level of blood acidity. With the higher acidity of the blood to add acidity to the cervical cells so that the more strongly mengkorosi the copper in the womb cells. The stronger the corrosion it will cause more inflammation in the uterus IUD users.

Based on research results Onur, et al, on the impact of copper-containing and levonorgestrel-releasing intrauterine contraceptives on cervicovaginal cytology and microbiological flora: A prospective study that colonization by Candida spp. and mycoplasma infection was diagnosed significantly more frequently after one year of use of Cu-IUD than in the baseline [5].

CONCLUSION

Based on the discussion then the conclusions obtained from this research is First, IUD can cause cervical cancer with level 3,33 times compared with that do not use IUD. Secondly, the use of IUD can cause various health complaints and bleeding with risk level 2,125 times compared to non IUD users. Third, Passive smokers participate in increased risk of IUD users experiencing complaints and bleeding with a risk level of 1.5 times compared with non-passive smokers.

RECOMENDATION

Further research is needed to reduce the risk of cancer due to IUD use. It is important to do risk communication to patients who want to use IUD as their contraceptive choice. Awareness needs to be made to the public so that smoking is not done in the house so as not to give exposure to cigarette smoke to other family members who do not smoke.

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A Proposed Monitoring and Evaluation Conceptual Framework for the Management of South African Private Sector HIV-AIDS Programmes

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ABSTRACT

Human Immunodeficiency Virus (HIV)-Acquired Immunodeficiency Syndrome (AIDS) in South Africa is a prominent health concern as more people are living with HIV-AIDS than any other country in the world. As such South Africa hosts the largest HIV-AIDS programmes globally[3].Appropriate management of HIV-AIDS treatment and wellness programmes are vital to ensure operational efficiency and cost effectiveness, hence ensuring optimal patient management. Integral to HIV-AIDS treatment and wellness programmes is programme monitoring and evaluation. Although monitoring and evaluation research has been conducted in the public HIV-AIDS health care sector with a variety of proposed tools/framework in existence; a substantial gap exists with similar HIV-AIDS programmes in the private healthcare environment. As it is not necessary to reinvent tools or frameworks for this environment, this article reveals how current smart practises from contextually relevant environments may be adapted to be implemented in private sector HIV-AIDS programmes. The treatment and management of HIV-AIDS is a continually changing process informed by state of the art international randomised controlled trials, global operational programme dynamics set against global, national and local ethical, regulatory requirements. It is inherent that HIV-AIDS wellness providers reengineer their service delivery so as to adapt industry standards to achieve best treatment and patient outcomes.

Keywords: *monitoring and evaluation, conceptual framework, HIV-AIDS*

INTRODUCTION

HIV - AIDS places a significant burden of disease on HIV-AIDS service providers in South Africa due to the increasing HIV prevalence and incidence in the region. These HIV service providers which offer HIV wellness, treatment and care and include the Department of Health facilities, non-governmental organisations ,organisations; faith based organisations, civil organisations and selected private organisations. HIV-AIDS service delivery is paramount to ensure that all citizens receive access to appropropriate and relevant treatment and care in order to curb the incidence of HIV-AIDS related disease mortality and morbidity. Current challenges with these HIV-AIDS programmes are suboptimal treatment outcomes, lack of proper fiscal management, lack of effective monitoring and evaluation systems and drug shortages[4]. These challenges often lead to inappropriate treatment and management of HIV-AIDS patients in the South African private, public and parastatal sectors. Urgent reviews and investigations into these programmes need to be undertaken to assess gaps in programme delivery and present solutions to enhance optimal service delivery. This paper reports on a study that was conducted at a private managed healthcare provider of HIV-AIDS services in South Africa. The HIV-AIDS programme was reviewed, investigated and analysed in order to provide tangible solutions to enhance HIV-AIDS service delivery across this and similar programmes. Data was reviewed from several multi-sectoral HIV-AIDS providers and will be used to inform the HIV-AIDS field regarding optimising monitoring and evaluation of HIV-AIDS programmes to enhance clinical management of patients. As the HIV-AIDS epidemic matures into its third decade of

existence, monitoring and evaluation of the epidemic becomes critical to ensure HIV-AIDS service delivery targets and goals are being met within budget constraints. This data will shared with public sector facilities and non-governmental organisations to ensure that HIV-AIDS treatment and wellness programmes are optimally managed to allow for greater public health impact.

LITERATURE REVIEW

South Africa has the largest ARV programme globally, with 48 % of adults on the programme[2]. South Africa's national public sector response to HIV-AIDS is spear headed by the South African National AIDS Council (SANAC).The council has made and continues to make bold strides toward the prevention and ultimate elimination of HIV-AIDS in South Africa. SANAC's key initiative is the development of the South African National Strategic plan for HIV, TB and AIDS (NSP). The plan addresses the key components of the HIV-AIDS and TB epidemics. This plan also explores key iniatives towards the improvement of service delivery though the various district levels within the country. The NSP 2012–2016 is driven by a long-term vision for the country with respect to the HIV-AIDS and TB epidemics. The South African Department of Health has adapted the three zeros proposed by UNAIDS to suit the local context[4]. The South African vision is: " zero new HIV-AIDS and TB infections; zero new infections due to vertical transmission; zero preventable deaths associated with HIV-AIDS and TB; and zero discrimination associated with HIV-AIDS, STIs and TB"[7].

RESEARCH METHODOLOGY

The central objective of this article is to: "*To propose a conceptual monitoring and evaluation framework derived from quality management systems for the management of HIV-AIDS private sector programmes that can be used in both public and private healthcare sectors through the analysis of current conceptual frameworks in HIV-AIDS healthcare and HIV-AIDS programmes within the South African context of HIV-AIDS healthcare provision".* [1]

Based on the imminent themes that emerged from the data review and analysis, this monitoring and evaluation framework is a synthesis of consensus-based international recommendations for monitoring HIV-AIDS treatment and care. The purpose of this conceptual framework for the monitoring and evaluation of HIV-AIDS private sector programmes is to allow management to plan the programme initiatives, implement the service offering and measure patient and healthcare responses to the service provision through monitoring efforts. Through evaluation, it is aimed that the programme will be reviewed and reports generated for relevant stakeholders to then improve and adapt the programme based on patient needs and best treatment practices.

RESULTS AND DISCUSSION

Several monitoring and evaluation frameworks across the various sectors have evolved in response to the HIV-AIDS epidemic. The global HIV-AIDS field utilises the Joint United Nations Programme on HIV-AIDS (UNAIDS) and United States Agency for International Development (USAID) monitoring and evaluation frameworks for HIV-AIDS programmes based on their versatility and relevance to the civil healthcare sector, public healthcare sector and para statal healthcare sector. The South African Department of Health has developed a South African National monitoring and evaluation HIV-AIDS Framework for use nationally in South Africa. The UNAIDS and USAID/Global Fund frameworks are the most widely used and accepted HIV-AIDS monitoring and evaluation frameworks globally and hence were chosen to be reviewed. These frameworks track important global milestones in the global battle against HIV-AIDS. The UNAIDS and USAID HIV-AIDS monitoring and evaluation frameworks recognise the need for a broader-based, expanded response to the epidemic in sectors ranging from health to economic development and the need to provide leadership and better-coordinated streamlined service delivery. These global frameworks offer support to countries regarding HIV-AIDS-related global activities, programme development and coordination global HIV-AIDS surveillance and resource mobilization. The South African National monitoring and evaluation HIV-AIDS Framework builds on the above and is relevant to the South African HIV-AIDS epidemic.

Currently, monitoring and evaluation frameworks assessing HIV-AIDS programmes have been developed for sector-specific responses and span different national and international arenas. The South African private managed healthcare sector manages HIV-AIDS specific programmes offering comprehensive HIV-AIDS treatment, wellness and care to selected patients on medical insurance. There is a current lack

of a contextually relevant, sector appropriate monitoring and evaluation HIV-AIDS framework for this sector, heralding an urgent need for development of such a framework.

Proposed monitoring and evaluation system

This proposed monitoring and evaluation system will be based on results as a powerful management tool in helping this healthcare organization demonstrate impacts and outcomes to their respective stakeholders. This programme will feature a results-based monitoring and evaluation system, emphasising outcomes and impacts of the programme while also examining programme implementation through programme inputs, activities and outputs. This monitoring and evaluation system will provide important feedback about the progress as well as the success or failure of the programme and will serve as an avenue for continuous learning, training and development.

The proposed conceptual monitoring and evaluation HIV-AIDS framework comprises:

Technical specifications of the indicators

Indicators offer a consistent and standardised evaluation of effectiveness when adapted for use in HIV-AIDS healthcare programmes. With specific reference to the private healthcare sector, indicators need to have a tailor-made feature correlating with health risk in order to ensure appropriate mitigation and high organisational impact. For this proposed conceptual framework for monitoring and evaluation of HIV-AIDS, private sector programme indicators will be sensitive and provide an early warning thereby enabling proactive decision-making. Indicators will also provide a retrospective view on risk events, so lessons can be learned from the past. Indicators will also provide a real-time actionable intelligence to decision makers and health risk managers. Risk management in healthcare is potentially more important than in any other industry. Risk rating of indicators is a key consideration for HIV-AIDS management.

iii. Digital automation

This article proposes that the conceptual framework be digitally automated to assist staff and management at the healthcare programme concerned. This can be easily achieved with programme developers and rigorous testing with application designers with integrating layout and analytics. New features can be updated based on alpha and beta testing. Considering the way in which mobile applications are continually changing the world with remarkable new applications being developed every day, this can be rolled out to monitoring and evaluation frameworks for HIV-AIDS. Health and hospital applications represent an area of incredible innovation, as healthcare workers are able to manoeuvre for education, learning and awareness. These apps can save time and provide useful information to the end-user.

A digitally automated conceptual framework will ease data collection as it will be automated; will allow for real time data trending; and provide daily, weekly and monthly reports on programme activities and programme targets. Access to data management will be controlled through managerial authorisations only in order to allow data integrity with minimal chance of data manipulation. Data reports can be generated based on the priority of indicators and can also be set up for alert functions to managers and programme decision makers. Functionality can also be set up to ensure snapshot dashboard and framework monitoring on smartphones and tablets at any time.

iv Mobile application development

Mobile applications are becoming very popular, spanning usage amongst all age groups and also across all sectors such as health, gaming, food, nutrition and fashion. Mobile applications also offer convenience and accessibility to all users and offer enhanced modes of mobile communication and collaboration. Given that mobile applications are revolutionising the way people think, live and learn, the researcher proposes that an added advantage of a digitally automated HIV-AIDS conceptual framework will be to develop a mobile application for intended users.

Following the necessary research and goal development, a wireframe and storyboard is created. In this phase, ideas and features fuse into a clearer picture. Wire framing is the process of creating a prototype of the application. Following wire framing, prototype testing occurs. The development of back end and front end processes occur next. Back end processes encompass how the developer customizes the user's experience. Following this, access control and data control occur, with data storage then considered. Data integration which allows users to access from and publishes data

to third party users occurs next. Front end processes encompass storing data locally to speed up load time, thereby allowing for synchronisation which enables off-line usage. Finally, the user interface design and development process occurs, which leads to the testing process. Testing should be done with different groups of people over several time frames in order to ensure that all errors are excluded and data integrity assured.

The development of a mobile application for the monitoring and evaluation an HIV-AIDS conceptual framework for a private sector HIV-AIDS programme will give a programme a competitive edge over other HIV-AIDS providers in the industry. A mobile application of this nature will allow for real-time data collection, collation and results provision. Data can be colour-coded and risk rated and provide a snapshot of whether the programme is in the red (danger) zone, yellow (caution) zone or green (good to go) zone. This will allow timeous interventions to be undertaken in real-time to address issues as they occur. Security measures can be installed to allow data integrity verification with all users, either getting read access or the ability to edit as well. Digital automation of this monitoring and evaluation HIV-AIDS conceptual framework is an example of an innovative health solution bridging the gap between HIV-AIDS healthcare and technological advancement

V Dashboard

Dashboards often provide at-a-glance views of key performance indicators relevant to a particular programme or project. The use of a dashboard as part of the proposed conceptual framework for the monitoring and evaluation of HIV-AIDS private sector programmes was proposed which could be used in both public and private healthcare sectors. Based on the literature review conducted for this research study, it is evident that no HIV-AIDS programmes in South Africa in the private sector are utilising dashboard functionality as part of the monitoring and evaluation conceptual framework to assess programme performance indicators was then proposed. The use of an HIV-AIDS dashboard structured according to a set of indicators based on risk stratification. Indicators can be triaged based on risk and programme outcome and mission. Triaging can be colour coded as red (severe); yellow (moderate); green (mild) and depending on the population of indicators, can be color coded to provide a visual measure of performance to gauge overall programme status as well as the problematic component.

CONCLUSION AND RECOMMENDATIONS

This article revealed the importance of methodological combinations for a better understanding of results and the mechanisms of changes in the evaluation of HIV-AIDS private sector activities. This HIV-AIDS monitoring and evaluation framework could help to homogeneously assess HIV-AIDS prevention, treatment and wellness activities currently being implemented by HIV-AIDS programmes within South Africa. In addition, the indicator matrix could help healthcare workers improve their HIV-AIDS monitoring and evaluation activities. The indicator matrix enables the detection of gaps in intervention levels in order to generate strategies that may enhance HIV- AIDS programmes in the future. The above proposed digitally automated conceptual framework provides a clear roadmap to HIV-AIDS programme planning; monitoring and evaluation. It delineates clear pathways to programme goals and objectives and defines relationships between programme inputs, processes, outputs and outcomes. It describes how programme factors interact with external and internal environmental factors. The dashboard and automation functionality allows real-time assessment of programme measures in a novel, innovative and user-friendly manner. Given that South Africa has a well-established multi sectoral response to HIV-AIDS with various public, private and NGO programmes dedicated to the on-going prevention, treatment and wellness of HIV-AIDS, there is a need to develop common tools which are imperative to HIV-AIDS operational research activities to streamline work activities and to attain the best results possible from HIV-AIDS programmes

A proposed framework such as this is not only relevant to the private HIV-AIDS sector, but can be adapted for use in other sectors to ensure a multi-sectoral response to the HIV-AIDS epidemic. The innovative computerised technique allows this conceptual framework ease of use and offers a competitive edge over its counterparts,

Ethical Clearance- was gained from the Faculty Research Committee of the Durban University of Technology as part of the primary author's doctoral thesis.

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Conflict of Interest - NIL

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Logistic Management Analysis of Medical Equipment in Padang Port Health Office

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ABSTRACT

The objective of this study is to know the process of storage, distribution, maintenance and control on logistic management of medical equipment at Padang Port Health Office. This research uses qualitative approach. The result of the study shows that the policy is guided by the Guidelines of Medical Device Management in Health Facilities in 2015 and regulations related to the management of state property but the existing policy has not been socialized to all health equipment managers and has not been downgraded in the form of technical guidelines or standard operating procedures. Human resources are less in terms of quality and quantity. The budgets are still lacking primarily. Infrastructure are still lacking mainly for the storage of medical equipment and warehouses. Implementation of storage, distribution, maintenance and control of health equipment logistic has not been implemented properly. The function test for 357 medical devices obtained 45 units (12,60%) of medical equipment can not be functioned, 3 units (0,84%) of health equipment can not be tested because there is no officer available and 21 units (5,88%) unknown health equipment.

Index Terms*— Analysis, Distribution, Logistic Management, Medical Equipment, Planning, Procurement, Storage.*

INTRODUCTION

World Health Organization (WHO) in 2015, states that more than 50% of health equipment in developing countries is not functioning or cannot be used optimally due to lack of maintenance efforts. WHO also estimates that 95% of medical equipment in developing countries is imported, most of which do not meet the needs of national health services and are not used effectively and efficiently [1,2,3].

Padang Port Health Office (PHO) is one of 49 Port Health Office in Indonesia. Padang PHO has been awarded as the best manager of State Property in all of PHO in Indonesia in 2014 and implementing logistics management system especially health equipment in order to achieve excellent service. However in the subsequent execution of whether this system is retained to date in accordance with regulations relating to logistics management [4].

Based on preliminary survey results, there are still many health tools that are stacked in some storage places, even some health equipment stored in the home office. Based on the review of documents from the State Property Report of Padang PHO in 2016 from 357 units of existing health equipment, 311 units (87.11%) of good health equipment, 5 units (1.40%) health equipment in damaged condition lightweight and 41 units (11,48%) health equipment in a state of severely damaged. The amount of equipment that is in a state of damage is closely related to the process of maintaining the tool.

In addition to the accumulation of goods, the problem found in the Padang Port Health Office is still there were health equipment that is not given the code number of goods. According to Decree of the Minister of Finance No. 29 / PMK.06 / 2010 of 2010 concerning the classification and verification of State Property, User of Goods / Proxy of Users of Goods must register and record State Property (BMN) into List User / List of User Power of Attorney according to and goods codification in order to realize the orderly administration and support the orderly management of State Property.

The results of the interviews that researchers conducted in the initial survey with the officer of BMN management on March 07, 2017 revealed that there are several items of medical equipment that has not been known to exist with the total initial value of IDR 4.791.477.250, - (four billion seven hundred ninety one million four hundred seventy seven thousand two hundred and fifty rupiah). The equipment is Blood Chemistry Analysis, Stethoscope, Defibrillator and Pacer Analyzer / tester, Pressure Transducer for NIBD and Filter Compressor. Besides, there is also a mutation of medical equipment without the knowledge of BMN managers.

Based on the above description, we need to conduct research on analysis of logistics management of health equipment at the Port Health Office of Padang.

METHOD

This type of research is qualitative research and data were analyzed with Miles and Huberman model through data reduction, Data Presentation and Verification. This study was conducted from January to December 2017 at Port Health Office of Padang.

Technique of taking informant in this research by purposive sampling that is sampling technique with certain consideration made by researcher based on characteristic or characteristic of population which have been known. Data collection in this research was conducted in several ways such as observation (observation), in-depth interview (Indepth Interview), and document review [5].

RESULTS

Policy

The policy for managing medical devices at Padang PHO is carried out based on the rules relating to the management of BMN such as the Regulation of the Minister of Finance of the Republic of Indonesia Number: 181 / PMK.06 / 2016 concerning Administration of State Property, Minister of Finance Decree Number 29 / PMK.06 / 2010 in 2010 concerning classification and codification of State property, Republic of Indonesia Minister of Finance Regulation No. 244 / PMK.06 / 2012 concerning Procedures for Implementation of BMN Supervision & Control, Minister of Home Affairs Regulation No. 17 of 2007 concerning Technical Guidelines for Regional Property Management and Tool Management Guidelines Health at the Health Facility and the user guide for each tool. Besides that, the manager of medical devices who work in the work area does not get a decree from the Head of the Padang PHO and the task as manager of the medical device is not included in the job description in employee work goals of each management officer.

Resources

The results of the study found that personnel in the implementation of medical logistics management in the Padang PHO in terms of quantity were not enough. Padang PHO should have as many as 6 electromedical personnel while the Padang PHO has only one electromedical staff. Existing electromedical technicians have not been fully involved in the management of medical devices because they are deemed not to understand the equipment available in the PHO and the other reason is that there is no electromedical technical function in the PHO position map. In terms of quality it is still lacking because the officers have never received training or socialization about the management of medical devices in addition to multiple positions.

Tools

Padang PHO does not yet have facilities and infrastructure in accordance with the standards set by the Indonesian Minister of Health as outlined in the Guidelines for Standardization of Human Resources, Facilities and Infrastructure in the Port Health Office Number 1314 / MENKES / SK / IX / 2010 Year 2010. Cabinets and shelves storage is still not good at the main office or in several regional offices.

Storage

The storage process begins with the acceptance stage carried out by electromedical personnel, BMN users and managers. The acceptance process is carried out through three stages, namely physical examination, function test and tool testing. Then the recording of the tool is done with the Application for BMN and tool labeling. Then the tool is submitted to the head of the section (user) using the Handover Minutes. Tools received by the user are then stored or distributed to the work area office. Tool storage is carried out according to the function of the tool. Tools that function to diagnose diseases are stored in polyclinics or blood chemistry laboratories. Tools for vector control and sanitation are stored in

vector laboratories and sanitation and warehouses for equipment and pesticides. Small tools are placed on the floor and large tools are placed on shelves or on the floor. Similar items but various sizes are grouped together by sorting from the smallest to the largest size.

Distribution

The process of distributing of medical devices in Padang PHO is carried out according to BMN rules, namely Minister of Home Affairs Regulation No. 17/2007 concerning Technical Guidelines for Regional Property Management and Guidelines for Management of Medical Devices in Health Facilities. The activity begins with a request for medical devices to the head section, after being approved for a physical examination, a functional test and a tool test. Transportation facilities for shipping medical devices and drivers are available. The process of physical expenditure of goods, transportation processes and demolition processes is pursued as best as possible to avoid damage during the shipping process. Some things that are not yet in line are the Minutes of Examination of distributed Goods and reports on the realization of medical devices distributed to working area is not been found yet. This happens because technical instructions and standard operating procedures on how to distribute medical devices at PHO are not yet available. Besides, medical officers have never received training or socialization.

Maintenance

The process of maintaining medical devices in Padang PHO has not been carried out in accordance with the Guidelines for Management of Medical Devices in Health Facilities because preventive maintenance and inspection activities have not been carried out. Maintenance activities carried out in the form of corrective maintenance carried out by each section without involving electromedical personnel except for maintenance of ambulance cars. There is no record book of corrective actions including the length of time for repairs and no reports of maintenance, in addition to the number of uncalibrated ales.

Control

The process of controlling medical devices at the Class II Padang Health Office has not been fully in accordance with Minister of Home Affairs Regulation No. 17 of 2007 concerning Technical Guidelines for Management of Regional Property. Control is carried out by the section head through bookkeeping / records checking.

DISCUSSION

Policy

According to the researchers' assumptions, seeing the many problems related to this policy indicate that health equipment management activities have not been a priority either by the Director General of Disease Prevention and Control of the Ministry of Health of the Republic of Indonesia the Padang Port Health Office. Whereas in carrying out medical device management activities at the Padang PHO, the first and fundamental step that must be carried out is to make the operational policies themselves from activities in real terms. This operational policy will move the organization to meet the management needs of medical devices in Padang PHO. Although nationally there are guidelines and regulations related to BMN as a reference, but in its implementation at the Padang PHO, technical guidelines and standard operating procedures need to be made in accordance with the characteristics of the Padang PHO so that implementation of standardized medical equipment management activities can be evaluated. Implementers of policies should be given a decree so that in carrying out their duties they have a legal basis for all actions that are used as legal aspects to determine or maintain something that is decided. It is recommended that the Head of the Padang PHO make a standard operating procedures for the management of medical devices so that the medical administrators in implementing management activities become more clear, systematic and standardized so that they can implement them appropriately.[7]

Resources

The quality of human resources involves two aspects as well, namely physical aspects, and non-physical aspects that involve the ability to work, think, and other skills. Therefore, efforts to improve the quality of human resources can also be directed to both aspects. To improve physical quality can be pursued through health and nutrition programs. Whereas to improve the quality or non-physical abilities, education and training efforts are the most needed.[8]

The implementation of logistic management of medical devices can run well should electromedical

personnel be added to 6 people in accordance with the Joint Regulation of the Minister of Health and Head of State Personnel Agency Number 46 of 2014 and Number 23 of 2014 concerning Implementation Guidelines for the Minister of Administrative Reform and Bureaucratic Reform of the Republic of Indonesia Number 28 of 2013 concerning the Functional Position of Electromedical Technical and Credit Numbers states that the number of electromedical personnel in the Class II Port Health Office environment is electromedical personnel of 6 people, consisting of; skilled 4 (four) people and experts 2 (two) people. In order for each work area to have one electromedical staff to manage medical devices that are available throughout the work area of the Padang PHO, the technical officers are more focused on working on their activities. Besides that, the electromedical personnel available are given roles according to their educational background. It is recommended that the Director General of Disease Prevention and Control as the main unit of the PHO add electromedical functional positions to the PHO position map.

Tools

Means are tools to facilitate and facilitate work. In the business world to achieve better results, besides human beings who are experts in their fields, materials / materials are needed as a means because material and means cannot be separated. Support for facilities such as workplaces, tools, transportation and funds is important for smooth work. The facilities used for logistics management of medical devices include cabinets, shelves and operational vehicles. Facilities that are available at this time should be maintained both in terms of quality and quantity because the facilities are very important to support the implementation of good health equipment management activities. It is expected that the Padang PHO can budget funds for the purchase of shelves or cabinets for the main office or regional office.[9]

Storage

Storage can be interpreted as an activity and business to carry out management, organization and arrangement of inventory items in the storage room. The process of storing medical devices in the Padang PHO is carried out based on BMN rules and Guidelines for the Management of Medical Devices in Health Facilities.[10]

DISTRIBUTION

The logistics distribution activity is basically a continuation of the process of storing or storing logistics or empirically is one part of the logistics warehousing activity itself. It is better if the manager of the medical device makes a Minutes of Examination of the Distributed Goods and reports on the realization of medical devices that are distributed to working are. In addition, officers need to be given training or outreach on ways of distributing good medical devices..

Maintenance

Maintenance of health equipment is a series of preventive and corrective activities carried out to maintain quality medical equipment, safe and usable). It is better if the manager of the medical device keeps a schedule of preventive inspections and maintenance and records corrective actions including the length of time for repairs. Electromedical power is involved in the maintenance of medical devices. For this reason, all medical personnel management is given training in maintaining good medical devices.

Control

In the control process, the delivery of the minutes of the results of the inspection to the manager of medical devices is very important to do as feedback from control activities. The delivery of this minutes will be a correction for managers to improve the process of managing medical devices at the next Padang PHO. The results of this examination need to be submitted to the Head of Padang PHO to be a note for policy makers in determining the steps to improve the management of logistic equipment in Padang PHO.

It is hoped that these control activities will be carried out by all section heads to all work areas. The results of the examination are poured into the Minutes of Examination Results. The event news is sent to the manager of medical devices and sent to the Head of Padang PHO. Training and outreach should be given to implementers of logistical control equipment in Padang PHO.

CONCLUSION

The logistics management policy for medical devices at the Port Health Office in Padang is guided by regulations relating to the management of State Property and Guidelines for Health Equipment Management in Health Facilities of the Directorate General of Health Efforts of the Ministry of Health, but the policies have

not been disseminated to all medical administrators and have not been revealed in the form of Technical Guidelines and Standard Operating Procedures that are specific to Padang Port Health Office. Managing staff in logistics equipment management activities at the Padang Port Health Office in terms of quantity and quality are still lacking. Funds and facilities for logistics equipment management activities are still lacking. The implementation of logistics equipment management activities at the Padang Port Health Office has not been implemented properly so that not all available medical devices are available in ready-to-use conditions.

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Conflict of Interest: Nil.

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The Effects of Extract Andaliman Fruit (*Zanthoxylum acanthopodium Dc*) *to* CAMP mRNA expression and Bacterial Load in Mice Balb-C after *Gardnerella vaginal* Infection

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ABSTRACT

This study aims to analyze the effects of extract Andaliman Fruit / *Zanthoxylum Acanthopodium Dc* (EZa) to CAMP mRNA expression and bacterial load in Mice Balb-C before and after *Gardnerella vaginalis* infection. Experiment to Balb-c mice consists of three groups; Control groups, given EZa 5 days groups and EZa 7 days groups prior *Gardnerella vaginalis* inoculation. Bacterial number and colonies, mRNA CAMP expression, were examined 3 and 5 days after inoculation of *Gardnerella vaginalis*. Data showed that administration of EZa extract for 7 days before *Gardnerella vaginalis* inoculation had a significant effect both on the decrease in bacterial number and bacterial colonies as well as in enhancing CAMP mRNA expression. The five-day EZa extract reduced the number of bacteria and increased mRNA expression significantly but was less effective in reducing the number of bacterial colonies. Controls group that was not given anything had significant increases in bacterial numbers and colonies, and increased CAMP expression was higher compared to another group. Conclusion: this study found Extract of *Zanthoxylum acanthopodium DC* (EZa) indicated as a potential anti-bacterial and immunomodulator especially to *Gardnerella Vaginalis* infection.

Keywords: *Andaliman Fruit, CAMP mRNA expression, Gardnerella vaginalis.*

INTRODUCTION

Indonesia has many natural ingredients that are often used as herbal medicine for various types of diseases. [1,2] Andaliman fruit or *Zanthoxylum acanthopodium Dc* is a species of the citrus family, Rutaceae that widely found in the area of North Sumatra, Indonesia which at the same time become the spice on food that is very liked by the community. This fruit is unique because its acidity is often used as an ingredient for traditional food made from raw fish.[3]

The family of Rutaceae family such as *Zanthoxylum armatum* has been extensively studied but the benefits of *Zanthoxylum acanthopodium Dc* still rarely studied. One of the benefits that have been studied is its ability to inhibit angiogenesis in breast cancer cells. [4-9]

One of the problems in Indonesia is bacterial vaginosis such as *Gardnerella vaginalis (GV)*. This bacterium is very risky in pregnancy and can also cause inflammation of the pelvis. This bacterial can be replaced by vaginal lactobacillus ant its characterized with low vaginal acidity.[10-12] Antibiotic treatments for this bacterial infection are not recommended because it is potential become a resistant or reoccurrence infection. It is suggested to try to find natural anti-microbial from plant or a non-pathogenic organism, recommended natural ingredients that affect bacteria while enhancing immune status. [13]

Natural ingredients that affect bacteria while enhancing immune status is supposed as good herbal medicine. Andaliman fruit has a flavonoid content that enables it to increase immune status as well as affect the

bacteria, but this is still an assumption that needs to be proven. One marker host defense to bacterial infection include *Gardnerella vaginalis* is cationic antimicrobial peptides (CAMPs). [14]

This study aims to analyze the effects of Andaliman Fruit extract Zanthoxylum acanthopodium Dc (Eza) to CAMP mRNA expression and bacterial load in Mice Balb-C before and after Gardnerella vaginal infection.

MATERIALS AND METHOD

Andaliman Fruit Extraction.

The andaliman fresh fruit was obtained from an altitude of Lake Toba region, namely in the village Buttumalasang North Sumatra Indonesia. Andalimanfresh fruit as much as 2.5 kg dried in the hot sun and dry andaliman freezer into fruit (1.8 kg). The extraction was done in the laboratory of Research Institute for Medicinal and Aromatic Plants (Balitro) with the following steps: preparation of a test (extract) beginning of the drying process using the oven for five days to simplicia. Simplicia (1500 grams) smoothed using a grinder with the fineness of 3-4 mm into a coarse powder, then soaked in a steel boiler using solvent 96% ethanol as much as 7500 ml (concentration of 1: 5 liter).

Extraction technique maceration was mixer / stirring for 3 hours, left to soak for 24 hours and is filtered using a filter paper to separate the residue and filtrate. Results filtrate in-rotavator or evaporation to separate the solvent to obtain a thick extract Andaliman fruit (fruit preparations andaliman ethanol extract yield 7%).

Animal.

Mice (Mus musculus) strain Balb-c female adults age 8-12 weeks weighing 18-20gram used as a test dose of the experimental animals. Animals are given standard feed ad libitum and be treated according to conventional cages.

Protocol Intervention.

Animals *Balb-C* female, healthy, age 8-12 weeks, weighing 18-20 grams are from Bogor PT.INDOANILAB adapted for seven days in the laboratory animal faculty of medicine Hasanuddin University with standard cages and feeding according to the standard laboratory indefinitely. Animal weighing eight days and then divided into three cages at random (random) with mean weight of not more than 20% of each group consisted of four tail as replication. K1: a control group (non EZa) CMC1% treatment by administering a dose of 0.1 ml / 10 grams of BB / as long as seven days by gavage, the 8th day of inoculation GV. K2: EZa group 5 days of treatment with 2% EZa administration dose of 0.1 ml / 10 g BW / day by gavage for five days, the 6th day of inoculation GV. K3: group EZa 7 days of treatment with 2% EZa administration dose of 0.1 ml / 10 g BW / day by gavage for seven days, the 8th day of inoculation GV.

GV Bacteria from the Laboratory of Microbiology UNHAS Makassar, a method of induction in mice that intravaginal inoculation concentration of $3x10^4$ @ 10µl (Sirait et al.2017). Blood samples for the measurement of CAMP gene mRNA in mice each performed three times, namely: before treatment, after treatment and three days after inoculation GV. CAMP gene mRNA expression was identified using real-time PCR. Samplingvaginal secretions using a vaginal swab for bacterial load measurement is performed three times: before treatment, 24 hours after inoculation GV and GV 3 days after inoculation. The bacterial load is identified by microscopic examination per 10 fields of view and culture PCA colony counting.

Statistical analysis

Data were analyzed using paired t-test and considered as significant if probability value (p-value) <0.05. Data were presented as a mean and standard deviation.

RESULTS

The data showed that mice given EZa for 7 days before inoculation with GV showed a higher bacterial decline (-27.0) than others and this decrease was statistically significant ($p<0.001$). Results also showed that mice were given EZA for five days before GV inoculation also showed a significant decline (-26.8) post-inoculation GV but lower than that of 7 days $p<0.001$). Control groups that were not given EZa did not experience a decrease in the number of bacteria instead had a significant increase ($p=0.004$) in the number of bacteria (+25.0) (Table 1).

TABLE 1: Effect Extract Zanthoxylum acanthopodium Dc (Eza) to the number of bacteria

Group	Total bacteria Mean±SD			P*
	day 1	**day 3**	**Change**	
Control	48.3 ±6.8	73.3±1.9	+25.0	0.004
EZa (5 days)	41.0±6.1	14.30 4.6	-26.8	<0.001
EZa (7 days)	34.5±5.2)	7.5±2.1	-27.0	<0.001

*Paired T-Test

+Increase

-Decreased

The data showed that after three days GV inoculation, mice were given EZa for seven days before injection with GV showed a higher number of bacterial colonies decline (-12.25) than others and this decrease was statistically significant (p<0.000). Results also showed that mice were given EZA for five days before GV inoculation did not show the number of bacterial colonies decline even increasing (+1.25) although not significant (p=0.312). Control groups that were not given EZa did not experience a decrease in the number of bacteria instead had a significant increase (p<0.001) in the number of bacteria (+54.75) (Table 2).

TABLE 2: Effect EZa to the number of bacterial colonies

Group	**Total bacteria Mean±SD**			**P***
	day 1	**day 3**	**Change**	
Control	45.00 ±3.74	100.75 4.65	+54.75	<0.001
EZa (5 days)	22.50± 1.29	23.75(1.71)	+1.25	0,312
EZa (7 days)	18.50±1.91	6.25(2.22)	-12.25	<0.000

Paired T-Test

+Increase

-Decrease

The data showed that mice given EZa for seven days before inoculation with GV showed a significant increasing (p=0.016) of CAMP gene mRNA expression (+0.79). Results also showed that mice were given EZA for five days before GV inoculation showed a significant (P<0.001) increase of CAMP gene mRNA expression (+1.52) post-inoculation GV but lower than the control group increased. Control groups that were not given EZa showed a higher increasing in the number of CAMP gene mRNA expression (p<0.001) in the CAMP gene mRNA expression (+2.93) than that mice given EZa for seven days before inoculation with GV (Table 3).

TABLE 3: CAMP mRNA expression three days after inoculation GV

Group	CAMP gene mRNA Expression Mean±SD			P*
	day 1	day 3	Change	
Control	5.25 (0.14)	8.18 (0.09)	+2.93	<0.001
EZa (5 days)	5.10 (0.12)	6 , 62 (0.14)	+1.52	<0.001
EZa (7 days)	5.06 (0.05)	5.86 (0.34)	+0.79	0,016

Paired T-Test

+Increase

-Decrease

DISCUSSION

Data showed that administration of EZa extract for seven days before GV inoculation had a significant effect both on the decrease in bacterial number and bacterial colonies as well as in enhancing CAMP mRNA expression. The five-day EZa extract reduced the number of bacteria and increased mRNA expression significantly but was less effective in reducing the number of bacterial colonies. Controls group that was not given anything had significant increases in bacterial numbers and colonies, and increased CAMP expression was higher compared to another group.

Extract of the *Zanthoxylum acanthopodium DC* (EZa) indicated to have potential as an anti-bacterial and immunomodulator especially to *Gardnerella vaginalis* infection. Some previous studies used in vitro and this study is relatively new because it uses invivo studies.

The content of the fruit of andaliman is quercetin and terpenoids; quercetin could induce CAMP, an Antimicrobial peptide (AMP) is very useful for bacterial elimination.[3, 15, 16] Attention to AMP including CAMP began to increase along with increased bacterial resistance to antibiotics; it is also interesting because this AMP has a broadspectrum activity.[17-19] EZa is potential as antimicrobial through its ability to induce CAMP. This assumption has been proven with a decreasing number of bacterial number and colonies due to EZa intervention.

CONCLUSION

Extract of the *Zanthoxylum acanthopodium DC* (EZa) indicated to have potential as an anti-bacterial and immunomodulator especially to *Gardnerella vaginalis* infection.

Ethical Clearance - Taken from Hasanuddin University Ethics Committee. Register Number: UH16010034. No. 1624 / H4.8.4.5.31 / PP36-KOMETIK / 2016. Dated January 8, 2016.

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Effect of Bibliotherapy on Self-Concept in Children with Mental Retardation in SLB

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ABSTRACT

Introduction: Children with mental retardation are children with special needs with a level of intelligence > 70. The self-concept of a child with mental retardation is influenced by their pattern of care as well as their environment. Rejection by the environment and deviations in care adjustments can cause the child to be unwilling to communicate and interact, to form a bad perception of development and self-concept. Thus, the researchers were interested in studying the effect of bibliotherapy on the self-concept of children with mental retardation in SLB. The purpose of this study was to investigate whether bibliotherapy had any influence on self-concept.

Method: This study was a quasi-experimental research study which involved 42 respondents as its population. The population was made up of 24 students of SLB Sasanti Wiyata and 18 students of SLB AKW Kumara II Surabaya. The sample of this study was made up of 36 respondents according to the inclusion criteria, gathered using a purposive sampling technique. The independent variable was bibliotherapy. The dependent variable was self-concept. The instruments used were the Robson Self-Concept Questionnaires. The data analysis used a Manova test in SPSS with a significant value $\alpha < 0.05$.

Result: The results showed, in the treatment group via a Manova test, 0.005 for self-image, 0.033 for personal identity, 0.001 for self-esteem, 0.004 for self-ideal, 0.198 for role. With partial eta squared, the results indicated that bibliotherapy can affect self-esteem with a value of 0.302. The provision of bibliotherapy in this research was found to have a positive influence and improved self-concept in children with mental retardation in SLB.

Discussion: Bibliotherapy can improve self-concept in children mental retardation in SLB. With bibliotherapy, children will learn and also imagine according to circumstances and desires. Moreover, one of the session in bibliotherapy encourage the children express their feelings.

Keyword: *self-concept, bibliotherapy, mental retardation, children.*

INTRODUCTION

Children with intellectual disability or mental retardation are children with special needs due to their low intelligence. There are two causes of intellectual disability in children, which are clinical and biological reason[120] The self-concept of mentally disabled children is influenced by parenting and their environment. Children with an intellectual disability who go on to go to the same school as normal children will tend to get a low number of academic achievements, especially in relation to comprehending numbers, concepts, and language. This makes children with intellectual disability get more commonly rejected by their friends when socialising[2–4].

According to the data from the Ministry of Social Services of the Republic of Indonesia in 2011, the number of people with intellectual disability was

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4,783,275. The Indonesian Ministry of Health's Data and Information Center in 2014 also published the number of children with mental retardation in Indonesia as having reached 6.6 million people, or three percent of Indonesians themselves[5]. In East Java, the prevalence of children with mental retardation is 125,190. Community Service Institution (*LPKM*) stated that the number of children with mental disabilities in Surabaya reached 10% and up to 20% in the lower grade of Schools for Exceptional Children (*Sekolah Luar Biasa/SLB*)[2]. Intellectual disability or mental retardation in children below 18-year-olds in developed countries has increased by 3-4 new cases per 1,000 children over the last 20 years[4].

There are three causes of intellectual disability in children; prenatal, perinatal and postnatal[120] The cognitive ability of children with mental retardation affects two areas of adaptive function, which are conceptual (language and memory competences) and social (intrapersonal communication competence and the ability to make friends)[6,7]. Self-concept is developed from self-perception and positive experiences. Involving children in the various activities existing around them will help them to gain confidence and help them to improve their ability to interact with others[8,9].

The abilities possessed by children with intellectual disability causes them to tend not to have friends. Thus, they will have a low sense of self-concept. They will also find obstacles to their mentality in term of attention, emotion, and self-expression[10,11]. As a result of the obstacles, children will find difficulty in the context of social relations, which is stressful[12,13]. Individual psychological changes in the form of anxiety, depression and crying, as well as extending to changes in their eating habits, sleep, and daily activities[14].

This study was conducted in order to improve the self-concept, self-identity, self-esteem, self-ideal and role of children with mental retardation. Self-concept can be seen in a child's behaviour in their visualisation of feeling optimistic and taking care of themselves. Self-identity can be seen in their ability to accept themselves and their behaviour, such as not isolating themselves and not avoiding others. Self-esteem can be seen in their confidence and their ability to respect others. Self-ideal is their ability to do the task well and to not to depend on others. The role is related to being able to express themselves and socialise with their peers[15,16].

MATERIALS AND METHOD

The design of this study was quasi-experimental with 42 respondents from 2 different SLB's for its population. The number of samples taken was 36. The samples were selected using the inclusion criteria. The samples of this study were children with mental retardation aged 8-15 years old. The technique used in the sampling process was purposive sampling[17].

The questionnaire was used as the instrument of this study. The questionnaire was in the form of a list of questions related to the characteristics of the research subjects. The instrument used to scale independent and dependent variables was *Robson Self-Concepts Scale* questionnaire adopted from Humaira's study (2017)[18]. The questionnaire used was tested for its validity and reliability by the experts in accordance to the objective of this study. The item in that instrument was considered to be valid and relevant if r count> r table = 0.3961, with 25 respondents.

There were 30 questions used to describe self-esteem, role, identity, self-ideal, and self-image. The questionnaire consisted of 14 positive questions and 15 negative questions. There were 5 questions for self-image, 6 questions for identity, 6 questions for self-esteem, 7 questions for self-ideal, and 6 questions for role. Before they were asked to fill out the questionnaire, the respondents were asked to agree on the inform consent form. Privacy and confidentiality were maintained in this study. This study used the statistical test Manova with *sig* $\alpha \leq 0{,}05$ on SPSS version 21.

The data was collected between the control group and the experimental group, in which the researcher gave an intervention in the form of bibliotherapy for 30 minutes in accordance to the SOP used[19]. In this study, additional mentors were needed to help with the intervention in as many as 3 people. In the treatment group, there were 18 children divided into 2, placed in a different location. From the 9 children in each school, they were all divided into two groups. Thus, there were 4-5 children in each group. On the first day of the first week, a group introduction was conducted. On the second day, the children watched two videos entitled "Teruslah Maju Menggapai Mimpi" and "*Tunjukkan* Bahwa Kita Sama". On the third day, the activity conducted was colouring. The researchers implemented the characteristics stage here, where the children could express their emotions

safely through art[10,20].

On the fourth-day in-depth concept, the stage was conducted by doing a discussion with children with mental retardation regarding what they felt when watching the video and colouring. On the fifth day, all of the three activities (watching a video, colouring, and a discussion) were conducted to ascertain the influence of the therapy given to the children[21]. In the second week, the same therapy was given. In the control group, the researchers did not provide any intervention besides the existing program from the school. After two weeks with 10 meeting-treatments, the post-test was held[3].

RESULTS

According to the data from Table 1 regarding the respondents' characteristics, most of the respondents were 11-12 years old. There were 8 children aged 11-12 years old in the experimental group and there were 7 children within this age group in the control group.

Table 1 - Respondents' Characteristic Distribution

Respondents' Characteristics	Experimental Group		Control Group		Homo-geneity Test
	Total	Percentage	Total	Percentage	
Age:					
8-10 years old	4	22.23%	5	27.78%	p = 0.002
11-12 years old	8	44.44%	7	38.89%	
13-15 years old	6	33.33%	6	33.33%	
Total	18	100%	18	100%	
Gender:					
Male	11	61.11%	11	61.11%	p = 0.000
Female	7	38.89%	7	38.89%	
Total	18	100%	18	100%	
Father's Educational Background:					
Junior High School	5	27.78%	1	5.56%	p = 0.000
Senior High School	11	61.11%	11	61.11%	
College/ University	0	0%	3	16.67%	
No School	0	0%	1	5.56%	
Died	2	11.11%	2	11.11%	
Total	18	100%	18	100%	

A statistical test was conducted to show that the respondents' characteristics in this study were not homogenous. The data was considered homogeneous if the results of the statistical test showed $\alpha = > 0.05$. The results of this study showed that the score for age was p=0.002, gender was p= 0.000, and father's educational background was p=0.000.

Table 2 - Mean and Standard Deviation of Bibliotherapy on Self-Concept

Variable	Experimental Group				Control Group				Sig.	Partial Eta Square
	Pre		Post		Pre		Post			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Self-Picture	9.17	1.200	10.17	1.681	8.56	1.542	8.61	1.501	0.005	0.208
Self-Identity	10.94	1.259	12.67	1.782	11.22	1.003	11.50	1.339	0.033	0.127
Self-Esteem	11.44	1.381	13.50	0.389	11.06	1.211	11.389	0.389	0.001	0.302
Self-ideal	14.00	0.970	16.11	0.412	14.67	14.14	14.333	0.412	0.004	0.127
Role	12.06	1.434	12.44	0.534	12.44	1.947	12.389	0.534	0.006	0.203

The statistical test in this study showed the mean and standard deviation. The results were analysed by the Manova test to ascertain the significant influence of bibliotherapy on the self-concept of children with mental retardation. The significant value of each variable was self-picture p=0.005, self-identity p=0.033, self-esteem p=0.001, self-ideal p=0.004 and role p=0.006. The results showed that bibliotherapy significantly influenced self-concept (p= 0.302; α= >0.05).

DISCUSSION

This study showed a significant improvement in the children's self-esteem. The result of the multivariate test proved that p-value <0.05. Thus, the significance level of self-esteem could be seen from the 95% level of confidence. Self-esteem improvement was also proven by partial eta square in the Manova test with a result of 0.302. The results of the observation also showed the significant improvement in their self-esteem. This improvement was visualised by the ability of the children with mental retardation to complete the task, to be confident, to answer the questions, and to state or mention their dreams. In short, bibliotherapy influenced the self-esteem of children with mental retardation[22]. It increased their confidence, which made them believe that they had the same abilities as other children.

Age was a factor which influenced how long they had undergone self-concept education, especially from their family and the school. This is in accordance with a study conducted by Alesi Rappo[2], in which age was able to change the children's self-esteem and behaviour. From the results of the observation conducted by the researchers during bibliotherapy for 10 days, the children's understanding was a bit difficult. Thus, each facilitator had to accompany them in order to facilitate their imagination. Moreover, by accompanying the children, the children's understanding and concentration, as well as their trust in the facilitators, increased.

The respondents' parents' level of education was mostly high school and junior high school graduates. There were also some parents who had no educational background. The parents' level of education was a factor which led to a low self-concept in their children. The researchers argued that the family environment, in this case, the parents, influenced the children in their self-concept development. During the child's development, their environment could determine the child's understanding level. The parents' background influenced not only the child's self-concept, but also their behaviour. The higher parents' level of education means that a better quality of parenting was given to their child, especially in relation to guiding their children in understanding self-concept, for children with mental retardation.

There were more parents of children with mental retardation who were private employees/entrepreneurs compared to parents who were jobless. This condition forced the parents to rarely take care of their children because they needed to meet the economic needs of the family. The busier the parents, the less often the parents provided a good example of behaviour and monitored their child's development. From the obtained data, there were children with mental retardation who had no parents. This caused the children to be insecure because they felt that they were unlucky and isolated themselves.

There was a significant improvement in the self-esteem observed in this study. This is in accordance with the study conducted by Zipora Shechtman[23], which stated that bibliotherapy could increase self-esteem. Another study showed that bibliotherapy is useful for children in identifying and exploring their emotions in order to control their child's reactions in difficult situations[22]. Bibliotherapy was found to be effective when used to improve the children's enthusiasm and motivation. Through bibliotherapy, children can learn and imagine as they wish. In bibliotherapy, there is the discussion method in which the children can express their feelings.

CONCLUSION

This study found that bibliotherapy was able to improve the self-picture, self-identity, self-esteem, self-ideal, and self-role of children with mental retardation. The results of the partial eta squared via the Manova test showed that self-esteem was the most influencing variable in bibliotherapy.

Ethical Clearance: This study has passed the institutional review board from Faculty of Nursing, Universitas Airlangga, Surabaya number 966-KEPK.

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Gender Differences in Relationship between Commuting and Health Outcomes in Jakarta Metropolitan Area, Indonesia

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ABSTRACT

Jakarta is the center of business and economy in Indonesia causing commuting workers to Jakarta every day become a common phenomenon. They pack Jakarta for working in the morning and return to their residence in the afternoon. This study aims to analyze the link between commuting and health and whether these relationships differ by gender. The study used a cross-sectional design of 4,533 commuters using the mode of transportation except walking/cycling. The findings of this study show that commuting has a physical impact only on male commuters, whereas the psychic influenced women and men, but has no impact on social outcomes. Public transportation has a lower health risk than cars and motorcycles, especially where the duration journey above 60 minutes. The findings of this study contribute to the academic field in urban development studies, including public transportation system, to minimize the impact of commuting for public health. The transition from private to public transportation should be encouraged to increase the benefits for the health of the commuter community.

Keywords: *commuting, health outcomes, gender*

INTRODUCTION

Jakarta is a megapolitan city and one of the largest cities in Southeast Asia and becomes the centre of economic growth in Indonesia and accounts for 80% of Indonesia's GDP1. This position has resulted in high mobility of people every day from sub-urban arround to Jakarta. This kind of people group are known as commuters. The commuter movement from and to Jakarta becomes a common phenomenon every day. Generally they head to Jakarta for work purpose but reside in a sub-urban area known as Bodetabek area (Bogor, Depok, Tangerang, and Bekasi). This is due to the high price/rent of house and living cost in Jakarta. In 2014 from 28 million people aged five years and over in Jabodetabek areas, as many as 3.6 million (13%) were commuters and the majority of them were for work purpose (82%)2.

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Jakarta is known as one of the most jammed cities in the world. This condition has influenced the duration of commuting. In Indonesia 2011-2014, some commuters spent more than 60 minutes (25%) in a single trip3. Some studies show that commuting gave impact on physical health, mental, social, and even commuter's quality of life. These impact on health are explained in three ways. First, commuting is associated with a variety of physiological responses, such as increased blood pressure and musculoskeletal disorders 4, increased risk of myocardial infarction and increased urine catecholamine5. Longer commuting time reduce physical activity, which positively associated with the hypertension, waist circumference and Body Mass Index (BMI)6. Physical activity is a risk factor for type 2 diabetes, cardiovascular, osteoporosis, and risk of metabolic syndrome7. Other studies have also reported that commuters have sleeping disorders and high fatigue 4,8,9. Second, the commuters experience stress exposure, therefore increasing negative mood causing anxiety, low tolerance, frustration8,10,11 and unhappiness12,13. Third, long commuting also gave impact on the social aspect. Commuting has limited individual's leisure time for recreational and social activities14.

The commuting effect correlates with commuting time and mode of transpor14. Car users have lower health and satisfaction and higher BMIs than those who use public transport. However, the use of public transport for more than 30 minutes actually decreases the level of life satisfaction, happiness and raises the level of anxiety15. Commuting travel patterns differ by gender16,17. Women, although they have a shorter trip distance than men, but they tend to use public transport, and have multi-purpose/destination trips such as working, shopping18. In addition, safety and security trip are important issues affecting women greatly, including become victims of sexual abuse1,18.

This study aims to analyze the relationship between commuting both duration and mode of transport with health and whether the relationship differs by gender.

MATERIALS AND METHOD

This study analyzes secondary data of the Jabodetabek Commuter Survey in 2014 from CBS Indonesia. The area coverage survey consisted of 13 regions in Jakarta, Bogor, Depok, Tangerang and Bekasi (Jabodetabek). The sample of this study is the commuter who commute for work with exclusion criteria: commuter by walking/ cycling. Final sample were 4533 persons.

Outcome variable is health outcomes include physical, mental/psychological and social aspects. These aspects are represented by the variables such as; physical; psychological/mental (feel stress, have had bad experiences such as accidents and sexual harassment); and social (involvement in community activities and refreshing). Alternative answers to these questions consist of two categories (yes and no).

Exposure variable consists of commuting time and mode of transportation. Commuting time is derived from the "long trip from house to place of activity (single journey)". The transportation mode is taken from the question of "the main mode of transportation commonly used". For analysis purpose, time and commuting modes are combined into one exposure variable, and classified into: 1) motorcycle> 60 min as *reference*; 2) motorcycle ≤ 60 min; 3) car ≤60 min; 4) car> 60 min; 5) public ≤60 min; and 6) public> 60 min. The covariates consist of socio-demography, family situation, and commuting patterns. Statistical analysis used binary logistic regression and Odds Ratio (OR) with 95% confidence intervals (CI) were estimated from the models.

FINDINGS

This study has shown if male commuters were older than female, married person were more, and only one-third were highly educated, while half of female were highly educated. All commuters work in the formal sector with the same average income between men and women. The majority of male commuters are the primary wage earner, and live with children (<13 years old) more in number compared to female commuters.

Commuting patterns have shown a difference between women and men. Women commuters have a shorter distance, commute less than five days a week, the numbers of modes of transportation were more than one type, and the transportation costs spent greater than that of men. Women commuters chose public transport and motorcycle for duration less than 60 minutes, while motorcycle becomes the main choice for men.

Table 1. Characteristics of commuters (%)

Variables	Female (n=1220)	Male (n=3313)	All (n=4533)	Difference of significance
Socio Demography				
Age (years)				
12-20	8.4	3.3	4.7	0.001*
21-30	39.3	25.3	29.1	
31-40	25.8	31.1	29.7	
41-50	18.2	25.3	23.4	
51-75	8.2	15.0	13.2	
Married				
Never	43.1	23.7	28.9	0.001*
ever married	56.9	76.3	71.1	

Cont... **Table 1. Characteristics of commuters (%)**

Education level				
≤ junior high school	9.5	16.9	14.9	0.001*
Senior high school	41.2	50.7	48.2	
University	49.3	32.4	36.9	
Type of worker				
Formal	96.2	91.9	93.1	0.001*
Informal	3.8	8.1	6.9	
Income (in rupiah/months)				
<=2.400.000	31.7	31.4	31.5	0.015*
2.400.001 - 3.000.000	24.9	23.3	23.8	
3.000.001- 5.000.000	27.7	25.6	26.1	
>5.000.000	15.7	19.7	18.6	
Family Situation				
Primary wage earner				
Yes	38.6	76.1	66.0	0.001*
no	61.4	23.9	34.0	
Number of productive household members				
1 - 2	10.2	8.6	9.0	0.031*
3 - 4	46.0	50.1	49.0	
> 4	43.9	41.3	42.0	
Living with child <13 years old	46.1	60.1	56.3	0.001*
Living with elderly	2.2	2.3	2.3	0.919
Commuting pattern				
The main mode and duration of commuting (minutes)				
public ≤ 60	27.4	7.2	12.6	0.001*
public >60	22.7	9.5	13.1	
car ≤ 60	6.5	8.1	7.6	
car > 60	6.0	6.7	6.5	
motor ≤ 60	29.1	49.5	44.0	
motor > 60	8.4	19.0	16.1	
Distances (km)				
< 10	32.5	27.2	28.6	0.001*
10-20	29.6	30.7	30.4	
21-30	22.2	21.5	21.7	
>30	15.7	20.6	19.3	
Frequency of commute (days/week)				
≥5	33.0	42.7	40.1	0.001*
< 5	67.0	57.3	59.9	
Number of mode of transport				
>1 mode	40.7	14.2	21.3	0.001*
1 mode	59.3	85.8	78.7	
transport cost per income				
≥ *11*	41.5	34.9	36.7	0.001*
< 11	58.5	65.1	63.3	

* significant at level 5%

Low physical health is felt by men and women with a prevalence of 22-37%. Physical complaints are the majority perceived by motorcycle users. Commuting is associated with low physical health for men only. Car's users have lower physical health risks compared to motorcycle users with <60 minutes, where public transport users have the same risks as motorcycle's users.

Table 2. Commuting and low physical outcome by gender

Variables	Physical outcome					
	Female (n=1220)			Male (n=3313)		
	n	Prev (%)	OR (95%CI)	n	Prev(%)	OR (95%CI)
Unadjusted:						
Public ≤60 min	334	37.1	1.13 (0.71-1.80)	238	37.8	0.97 (0.71-1.31)
Public >60 min	277	37.2	1.13 (0.70-1.82)	316	36.7	0.92 (0.70-1.22)
car ≤ 60 min	79	25.3	0.65 (0.34-1.25)	267	21.7	**0.44 (0.32-0.62)**
car >60 min	73	23.3	0.58 (0.30-1.15)	223	29.1	**0.65 (0.47-0.91)**
Motorcycle ≤60 min	355	38.0	1.18 (0.74-1.86)	1640	36.7	0.92 (0.76-1.11)
Motorcycle>60 min	102	34.3	1.00	629	38.6	1.00
Adjusted:						
Public ≤60 min			1.11 (0.63-1.94)			0.74 (0.49-1.11)
public>60 min			1.40 (0.77-2.54)			0.71 (0.46-1.09)
car ≤ 60 min			0.90 (0.43-1.88)			**0.45 (0.31-0.66)**
car >60 min			0.88 (0.41-1.88)			**0.69 (0.47-1.00)**
Motorcycle ≤60 min			1.06 (0.64-1.74)			**0.87 (0.70-1.08)**
Motorcycle>60 min			1.00			**1.00**

***Bold text:** significance at the 5% level. Low physical outcomes: any three or more complaints in last months. Prev: Prevalence

Psychological problems in commuting were higher than physical problems. The condition is felt both in men and women. For female commuters, low psychological risk is felt by users of public transport and motorcycle with duration less than 60 minutes compared to motorcycle's users with duration of more than 60 minutes, while other mode users are not significant. For male, the psychological impact correlated with commuting except on the car users with duration of more than 60 minutes. Similar to female, low risk men also appeared for public transport users, car users and motorcycle users with duration of less than 60 minutes compared to motorcycle users with duration of more than 60 minutes.

Table 3. Commuting and Low physiological outcome by gender

Variables	Mental outcome					
	Female (n=1220)			Male (n=3313)		
	n	Prev (%)	OR (95%CI)	n	Prev (%)	OR (95%CI)
Unadjusted						
Public ≤60 min	334	52.7	**0.40 (0.25-0.65)**	238	48.7	**0.31 (0.23-0.43)**

Table 3. Commuting and Low physiological outcome by gender

public>60 min	277	67.5	0.75 (0.45-1.24)	316	57.0	**0.44 (0.33-0.58)**
car ≤ 60 min	79	63.3	0.62 (0.33-1.17)	267	60.7	0.51 (0.38-0.69)
car >60 min	73	64.4	0.65 (0.34-1.25)	223	73.1	0.90 (0.63-1.27)
Motorcycle ≤60 min	355	56.1	**0.46 (0.28-0.75)**	1640	61.0	**0.52 (0.42-0.63)**
Motorcycle>60 min	102	73.5	1.00	629	75.2	1.00
Adjusted						
Public ≤60 min			0.30 (0.17-0.54)			0.32 (0.21-0.48)
public>60 min			0.56 (0.30-1.02)			0.39 (0.25-0.59)
car ≤ 60 min			0.68 (0.34-1.39)			0.46 (0.32-0.65)
car >60 min			0.72 (0.35-1.49)			0.74 (0.50-1.10)
Motorcycle ≤60 min			0.47 (0.28-0.79)			0.59 (0.47-0.74)
Motorcycle>60 min			1.00			1.00

***Bold text:** significance at the 5% level. Low physiological outcome: any three or more complaints during commuting

Table 4 shows the prevalence of commuters with low social outcomes in women 20-41% while in males 13-35%. Car user commuters have the lowest social outcomes. However, it turns out that commuting is not related to social outcomes in both men and women.

Table 4. Commuting and Low social outcomes by gender

Variables	**Social outcomes**					
	Female (n=1220)			**Male (n=3313)**		
	n	**Prev (%)**	**OR (95%CI)**	**n**	**Prev (%)**	**OR (95%CI)**
Unadjusted						
public≤60 min	334	40.7	1.21 (0.76-1.91)	238	35.3	**1.67 (1.21-2.30)**
public>60 min	277	22.0	**0.50 (0.30-0.81)**	316	29.4	1.28 (0.94-1.73)
car ≤60 min	79	20.3	**0.45 (0.23-0.88)**	267	13.5	**0.48 (0.32-0.71)**
car >60 min	73	23.3	0.53 (0.27-1.05)	223	14.3	**0.51 (0.34-0.78)**
motorcycle≤60 min	355	26.5	0.63 (0.40-1.01)	1640	25.1	1.03 (0.83-1.27)
Motorcycle>60 min	102	36.3	1.00	629	24.6	1.00
Adjusted						
public≤60 min			1.28 (0.72-2.28)			1.28 (0.72-2.28)
public>60 min			0.60 (0.32-1.13)			0.60 (0.32-1.13)

Cont... **Table 4. Commuting and Low social outcomes by gender**

car ≤60 min			1.22 (0.55-2.69)			1.22 (0.55-2.69)
car >60 min			1.17 (0.53-2.57)			1.17 (0.53-2.57)
motorcycle≤60 min			0.63 (0.38-1.06)			0.63 (0.38-1.06)
Motorcycle>60 min			1.00			1.00

***Bold text:** significance at the 5% level. **Low social outcomes:** commuter did not perform social activities & refreshing in the last month.

The study show that commuting is related to health outcomes and differs by gender. Physical effects felt by men, while the psychological impact felt both by men and women. The impact of commuting correlated with the mode and duration of commuting. The public transport users have a health risk lower than car and motorcycle users. The study findings support the previous studies that public transport is positively correlated with health12,15,16,19. Switching commuters from private cars to public transport can provide health benefits as well as active commuting (walking/cycling). This situation becomes a potential factor for increasing energy expenditure and reducing body fat because the public transport user performs physical activity in the form of walking towards public transit20,21. In addition, public transport users have lower stress levels than car users11 and they have time to relax such as reading, listening to music, and socializing22. In this study, quite a lot of commuters choose a motorcycle as a mode of commute, whereas a high risk compared to other modes especially if the duration of commuting more than 60 min. Motorcycle has a high risk of accidents because it depends on distance, speed, and frequency of uses23.

The analysis of this study has considered some confounder variables, but other variables that substantially act as confounder are not available such as commuter compensation (job satisfaction/housing quality), gender roles in households, and contextual variables (traffic jam level/public transportation system). The study also used a cross-sectional design, so the researcher cannot conclude that commuting has a causal effect on health, there may be other causes of health problems and daily life of commuters that affect commuting.

Although this study has its limitations, this study has an important contribution to understanding the complex relationship between commuting and health by gender. Future studies are expected to use longitudinal study and consider other covariates thus strengthen the results of this study.

CONCLUSION

This study concludes that there is a commuting relationship with commuter health, and the relation is different according to gender. The impact is greater on car and motorcycle users especially on long durations than public transport users. These findings may become the basis of consideration for the government in urban development to minimize the impact of commuting. The biggest challenge is to encourage commuters to switch to public transport, which has benefits for public health. This effort is certainly accompanied by improvements of the quality of public transport from aspects of affordability, convenience, and security especially for women.

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Ventilation with Risk Quotient (RQ) Benzene Non-Carcinogen in the Shoes *Home Industry* of Romokalisari, Surabaya

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ABSTRACT

The objectives of this study were to identify the presence of ventilation, Risk Quotient (RQ) of benzene non-carcinogen and the relationship between them in the shoes home industry of Romokalisari, Surabaya. Type of study was observational, cross sectional analytics with 10 workers as total population.

Data analysis was using cross tabulation to know the frequency of ventilation and Risk Quotient (RQ), that obtained from the value of Intake benzene non karsinogen (Ink), benzene concentration in work environment (C), inhalation rate (R), length of work/day (tE), working frequency/year (fE), duration of work (Dt), worker's weight (Wb) and average time period (t_{avg}). Analysis relationship between ventilation with Risk Quotient (RQ) of benzene non carcinogen was using Chi-Square Test and Prevalence Risk (PR).

The results obtained most of the workplace were not ventilated (9 places (90%)). Concentrations of benzene in the environment 0.04 mg/m^3-2.91 mg/m^3. Inhalation rate (R) 0.5 m^3/hr-0.7 m^3/hr. Length of work per day (tE) 8 hours/day-15 hours/day. Frequency of work per year (fE) 312 days/year-365 days/year. Duration of work (Dt) 14 years-43 years. Weight of worker (Wb) in 8 people (80%) ≤70 Kg. RfC benzene 0.03 mg/m^3. Risk Quotient (RQ)> 1, indicating that there was a possibility of non-carcinogenic health risks. P-value was 0.035, meaning there was relationship between the existence of ventilation with the Risk Quotient (RQ) benzene non-carcinogen in workers. Prevalence Risk (PR) was 9.000, meaning that the absence of ventilation has a risk 9 times greater for the risk of non-carcinogen health effects. Recommendations were by making good ventilation in the workplace and consuming CYP2E1 enzyme contained in cow liver and salmon to lower benzene levels in the body.[13]

Keywords : *Benzene, Ventilation, Risk Quotient, Workers, Shoes Home Industry*

INTRODUCTION

Benzene is widely used as a good organic solvent for various industrial processes such as rubber industry, shoes, paint solvents, components in motor fuel, components in detergents, pesticides and pharmaceutical manufacturing.[3] The US-EPA has classified benzene as a carcinogenic substance against humans (GrupA), so now the use of benzene as a solvent is increasingly constrained.[20]

In general, people can smell benzene from concentrations of 60 ppm to 100 ppm and to feel benzene in water at concentrations of 0.5 to 4.5 ppm.[7] Based on Permenakertrans Nomor Per.13/MEN/X/2011 about Threshold Limit of Physical Factor and Chemical Factors at Work, maksimum benzene exposure is 1.59 mg/m^3,[12] American Conference of Governmental Industrial Hygienists (ACGIH) states the limit of benzene exposure is 0.5 ppm with maximum exposure for 8 hours of work,[1] while the American Petroleum Institute (API) states that the absolute limit of safe exposure to benzene is zero.[14,16]

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Continuous exposure to benzene and exceeding predetermined threshold values can cause adverse health effects, especially exposure through inhalation. The impacts that can arise from acute exposure to benzene can cause disruption of the nervous system, lack of oxygen supply to the brain, dizziness, rapid heartbeat, headache, tremors, confusion and fainting.[18,19] Benzene toxicity to the central nervous system arises after exposure to benzene through inhalation/respiration with high concentrations (3,000 ppm for 5 minutes) or 30 to 60 minutes via digestion.[3]

Based on the study previously about benzene and affect to the body have not been conducted study about effect ventilation to the risk quotient yet. As non formal Industry, shoes industry should to know effect ventilation to RQ worker for preventing disease by benzene.

The shoes home industry of Romokalisari, Surabaya is a small shoes manufacturing sector in Surabaya. In the production process in the shoes home industry of Romokalisari, Surabaya there is the process of gluing shoes with the use of glue materials in which there is a chemical content of benzene. In addition, the presence of ventilation in the shoes home industry of Romokalisari, Surabaya allegedly can affect the level of exposure of benzene in the workplace. Therefore, the study aims to determine the existence of ventilation, Risk Quotient (RQ) of benzene non-carcinogen and the relationship between the existence of ventilation with Risk Quotient (RQ) benzene non-carcinogen in home industry shoes Romokalisari, Surabaya.

MATERIALS AND METHOD

This study was an observational study with cross sectional analytical design in home industry of shoes Romokalisari Surabaya with total population counted 10 workers. This study was conducted at home industry of shoes Romokalisari, Surabaya in October 2017.

Variables in this study were the presence of ventilation and Risk Quotient (RQ) of benzene non-carcinogen. Determination of Risk Quotient (RQ) of benzene non-carcinogen was calculated from Intake benzene non-carcinogen (I_{nk})/RfC. The value of Intake benzene non-carcinogenic was the result of calculation that was directly proportional to the value of benzene concentration in the working environment (C), inhalation rate of worker (R), length of work/day (tE), working frequency per year (fE), duration of work (Dt) and was inversely proportional to the worker's characteristic value (consisting of worker's weight (Wb) and average time period (t_{avg}).

Primary data collection included the presence of ventilation data and worker characteristics (worker's weight (Wb), length of work / day (tE), working frequency every year (fE), duration of work (Dt)). Secondary data collection included benzene concentration value data in work environment (C), worker inhalation rate (R) and average time period (t_{avg}) used for non-carcinogen intake benzene (I_{nk}) and RfC value used to calculate Risk Quotient (RQ).

Data analysis was using cross tabulation to know the frequency of the presence of ventilation and frequency of value to determine Risk Quotient (RQ) of benzene non-carcinogen that is result of calculation from Intake benzene non-carcinogen (I_{nk})/RfC. To determine the value of non-carcinogen intake benzene (I_{nk}), it was necessary to know the frequency of benzene concentration values in the work environment (C), inhalation rate of worker (R), length of work/day (tE), frequency of work each year (fE) , working duration (Dt), worker's characteristic value (consisting of worker's weight (Wb) and average time period (t_{avg}). The relationship analysis of the presence of ventilation with Risk Quotient (RQ) of benzene non-carcinogen was using Chi-Square Test and to know the amount of risk was using Prevalence Risk (PR).

FINDINGS

The Presence of Ventilation

Based on Table. 1 below, it could be seen that most of the place workers to work in the shoes home industry of Romokalisari, Surabaya had no ventilation that was counted 9 places (90%).

Tabel 1. Distribution of The Presence of Ventilation at Worker's Place in The Shoes Home Industry of Romokalisari, Surabaya

The Presence of Ventilation	N	%
Yes	1	10,0
No	9	90,0
Total	**10**	**100,0**

Based on Peraturan Menteri Kesehatan Republik Indonesia No. 48 in 2016 about Occupational Safety

and Health Standards in Office, it said that one of the requirements of building safety and security was the availability of ventilation for circulation and air exchange needs, especially when there were equipment that used solvent such as benzene. In addition, based on Keputusan Menteri Kesehatan Republik Indonesia Nomor 1405/MENKES/SK/XII/2002 in 2002 about the Health Working Environment Requirements in the Office and Industry, it said that every office space and industry had to had air/ventilation holes. Standard air exchange was 0.283 m^3/min/person with ventilation rate of 0.15 to 0.25 m/s. For non-cooling working rooms should had a ventilation hole at least 15% of the floor area by applying a cross ventilation system.[11]

LEED[10], ASHRAE[2], and ICC[9], suggested that additional ventilation at the end of construction would reduced VOC concentrations (including benzene) to acceptable levels. In indoor environmental studies, BRE reported that seasonal variation in indoor air concentrations was due to higher concentrations of exterior air infiltrated to buildings, and a greater effect of indoor sources during the winter than in the summer months. This wass because the available ventilation at a low/bad level.[4] VOC concentrations including benzene are reduced when the level of ventilation and material emission standards were met.[8]

Risk Quotient (RQ) of Benzene Non-Carcinogen

The following on the below were data of benzene concentration, inhalation rate, worker characteristics, non-carcinogenic benzene intake and Risk Quotient (RQ) in the shoes home industry of Romokalisari, Surabaya.

Tabel. 2 Data of Benzene Concentration, Inhalation Rate, Workers Characteristic, Intake Benzene Non-Carcinogen and Risk Quotient (RQ) of Benzene Non-Carcinogen in The Shoes Home Industry of Romokalisari, Surabaya

No. Workers	C mg/m^3	R m^3/jam	tE Jam/hari	fE Hari/Tahun	Dt Tahun	Wb Kg	t_{avg} Hari	I_{nk} mg/Kg/hari	RQ mg/Kg/hari
1.	1.12	0.5	13	312	43	42	10950	0.2285	26.8785
2.	1.12	0.6	9	312	43	52	10950	0.1390	16.3475
3.	0.06	0.6	14	312	36	50	10950	0.0099	1.1686
4.	0.06	0.6	8	312	40	48	10950	0.0065	0.7608
5.	1.27	0.7	10	350	27	70	10950	0.1019	11.9865
6.	1.27	0.6	8	365	20	50	10950	0.0781	9.1863
7.	1.27	0.7	8	312	14	80	10950	0.0345	4.0540
8.	1.27	0.6	15	365	23	53	10950	0.1624	19.1039
9.	2.91	0.7	10	312	25	85	10950	0.1691	19.8992
10.	0.04	0.7	15	365	20	70	10950	0.0037	0.4375
Average								0.0933	10.9823

In Table. 2 above, the value of Intake benzene non-carcinogenic (I_{nk}) can be calculated using the following formula:

$$Intake \text{ Benzene Non} - \text{Carcinogen} = \frac{\text{C x R x tE x fE x Dt}}{\text{Wb x Tavg}}$$

Based on the calculation of Intake benzene non-carcinogen (I_{nk}) value above, it was known that the maximum intake value received by workers in the shoes home industry Romokalisari Surabaya was 0.2285 mg/Kg/day).

$$Risk\ Quotient\ (RQ) = \frac{Intake}{RfC}$$

Risk Quotient (RQ) of benzene non-carcinogen determines benzene exposure having non-carcinogenic risks in the worker's body or not. The value of Risk Quotient (RQ) is calculated using the following formula:

It was known that the non-carcinogenic benzene RfC values established by US-EPA[21] are 0.03 mg/m^3 or 0.0085 mg/Kg/day. Based on the calculation table above, the average value of Risk Quotient (RQ) on workers in the shoes home industry of Romokalisari, Surabaya was 10.9823 mg/Kg/day and the highest RQ was 26.8785 mg/Kg/day. This showed that RQ>1, meaning that there was a possible indication of the risk of non-carcinogenis health effect and the need for control measures.[15]

This was in accordance with the results of study that conducted by Edokpolo, Yu and Conneli[5] on the Health Risk Assessment for Exposure to Benzene in Petroleum Refiney Environments, found that RQ>1 for scenarios 2A and 3A indicating possible health risks for groups exposed to benzene. A study conducted by Fahrudi[6] on the Risks of Cancer and Non-Cancer at Benzene Exposure Workers in Home Industry Shoe Kelurahan Oso Wilangun Surabaya, found that benzene levels measured in the workplace air ranged from 0.04 mg/m^3 to 7.44 mg/m^3, RQ≤1 was counted 8 people (40%), RQ>1was counted 13 people (60%) and ECR calculation got all workers with ECR value>10^{-5} was counted 20 people (100%).

The Presence of Ventilation with Risk Quotient (RQ) *of Benzene Non-Karsinogen*

In the bivariate analysis of the relationship between the presence of ventilation with Risk Quotient (RQ) of benzene non-carcinogen, the Risk Quotient (RQ) variable was made in 2 values, that were RQ≤1 and RQ> 1 in the Prevalence Risk (PR) calculation. The following below was relationsip between the presence of ventilation with Risk Quotient (RQ) of Benzene Non-Carcinogen.

Tabel. 3 Relationship between The Presence of Ventilation with Risk Quotient (RQ) of Benzene Non-Carcinogen The Shoes Home Industry of Romokalisari, Surabaya

The Presence of Ventilation	Risk Quotient (RQ)				Total		p-value	Prevalence Risk (95%CI)
	RQ≤1		RQ>1					
	N	%	N	%	N	%		
Yes	1	10.0	0	0.0	1	10.0	0.035	9.000 (1.418-57.1117)
No	1	10.0	8	80.0	9	90.0		
Total	**2**	**20.0**	**8**	**80.0**	**10**	**100.0**		

Based on the results in Table. 3 above, it was found that the p-value of the relationship between the presence of ventilation with Risk Quotient (RQ) of benzene non-carcinogen was 0.035 and when compared with α that was 0.005 then p-value 0.035 was smaller than α so it could be seen that there was a relationship between the presence of ventilation with Risk Quotient (RQ) of benzene non-carcinogen in the shoes home industry of Romokalisari, Surabaya.

Prevalence Risk (PR) showed 9.000, meaning that the absence of ventilation was 9 times greater risk for non-carcinogen health effects (RQ>1) to workers in the shoes home industry of Romokalisari, Surabaya and there was a significant relationship between the presence of ventilation and the value Risk Quotient (RQ) to worker in the shoes home industry of Romokalisari, Surabaya which could be seen from PR value does not pass 1 (1,418-57,1117).

These results were consistent with the theory expressed by LEED[10], ASHRAE[2], and ICC[9], suggesting that additional ventilation at the end of construction would reduce VOC concentrations (including benzene) to acceptable levels. VOC concentrations including benzene were reduced when ventilation levels and material emission standards were met.[8] According to the Tokyo National Institute of Technology and Evaluation, indoor benzene concentrations were usually higher than in the open air which could be caused by the entry and accumulation of benzene from external sources and the presence of dominant benzene sources indoors.[17]

CONCLUSION

The result of study found out that most of places (90.0%) for workers to work did not had ventilation. The most of worker in the shoe home industry of Romokalisari, Surabaya had Risk Quotient (80.0%) more than 1. There was a significant relationship between the presence of ventilation with Risk Quotient (RQ) of benzene non-carcinogen in the shoes home industry of Romokalisari, Surabaya (p-value = 0.035, Prevalence Risk = 9.000). Recommendation were by making

ventilation in a good workplace and by consuming CYP2E1 enzyme contained in beef liver and salmon that serves to lower benzene levels in the body.[13]

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