Case Based Method in Pathophysiology of Non-Communicable Diseases Topic Improves Student Performance of Undergraduate Nutrition Students at Publich Health Faculty, Andalas University

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ABSTRACT

Pathophysiology of non-communicable diseases is one of topic in the third semester undergraduate nutrition students at Faculty of Public Health University of Andalas. The case based method is becoming an increasingly common teaching strategy in science education especially in medical education. This study aim to analyze knowledge and behaviour of student after using case based method. The assessment of student perfomance carried out in this case based method includes behaviour score is seen from the assessment rubric which includes communication skills, material understanding, accuracy of case analysis, and ability to answer questions. While, knowledge seen from the quiz scores between before and after (pretest and postest). Sample selected using the total sampling method with inclusion The criteria for taking the pathophysiology course of non-communicable diseases and informed consent with total sample 50 people. The result of the study shows The average value of the Ability to answer questions still in average category. In other hands, the indicator of communication skill, material understanding, and accuracy of case analysis have a close value with a small difference but still in the same category (Good). the pretest and posttest of student knowledge scores showed significant differences in the all of the case.

Keywords: case based methode, knowledge, behaviour

1. INTRODUCTION

Case based methode learning is are very easy to adapt to problem-based learning and the development of students' analytical skills[1]. Several studies have shown that working in groups to solve a case can significantly improve students' perceptions of learning and can improve performance on assessment questions (performance), and can increase student engagement in case study activities [2,3]. Aditionally, it shows that case-based learning is effective in increasing the knowledge and skills of nursing students in identifying problems [4,5.]

The Pathophysiology of Non-Communicable Diseases course is a compulsory subject in the third semester of the Bachelor of Nutrition study program, Faculty of Public Health, Andalas University. The Pathophysiology of Non-Communicable Diseases courses based on the Biomedical Sciences Group Determination of the Undergraduate Nutrition Curriculum issued by AIPGI with learning outcomes in the form of being able to think broadly (meta-cognitively) with a scientific basis; Able to explain basic theory, nutrition science and technology and related sciences (food science, biomedicine, humanities, and management) in a structured manner; and Able to communicate effectively in counseling services, nutrition education, and dietetics to deal with individual, group and community problems according to the results of the study and take into account nutritional considerations;

This course discusses the process of occurrence of various diseases and metabolic disorders in humans in terms of nutrition, especially degenerative diseases, endocrine disorders, kidney disorders, burns, malignancy/neoplasia, and perioperative conditions. The depth of the material includes the introduction of symptoms, general signs, etiology, epidemiology, medical diagnosis, medical data and therapies used in order to consider giving diet to patients.

The pathophysiology course of non-communicable diseases is one of the courses that requires case study so that the materials are easier to understand. Based on the analysis of student exam results in the previous year, questions related to the diagnosis, etiology and nutritional management of non-communicable diseases were generally answered incorrectly by students.

Based on the distribution of student scores in the Pathophysiology of Non-Communicable Diseases course in the Odd Semester of the 2019/2020 Academic Year, information is obtained that there are still around 3.5% of students with a B grade and below and 12.28% with a B grade. This course is one of the subjects courses that must be mastered by students and pre-requisite courses in taking the next course, especially Field Work Practices or Registrars (semester VII). For this reason, it is expected that there will be a higher percentage of students who get B grades and above so that student learning outcomes can be fulfilled.

The problem in terms of learning achievement and application of learning methods is that there are still many students who are not actively discussing in class, the analytical ability or students' reasoning power is still quite low in studying a case of disease in relation to nutrition. In addition, the weakness encountered is that not all students have the courage to ask opinions and questions in class. So it is necessary to change the learning method with the Case-Based method, which is a case-based learning approach involving students in discussions of certain scenarios that resemble or are usually real-world examples. Through the development of this learning approach, students are expected to be more active in asking opinions or questions and increasing students' reasoning and analysis power in discussing a case scenario during the learning process.

2. METHOD

This study uses a quasi-experimental design with one pretest-posttest design group. Population used in this study were 50 students of the nutrition study program who took the pathophysiology course of non-communicable diseases. Sample selected using the total sampling method with inclusion The criteria for taking the pathophysiology course of non-communicable diseases and informed consent with total sample 50

people. The sample is divided randomly into 5 small groups with a total of 10 participants in each small group to facilitate discussion using case-based method. This research Conducted in September 2021 at the Faculty of Public Health, Andalas University. Students know how to solve cases using the case-based method, and Then the student's skills in classifying non-communicable diseases are assessed based on the introduction of symptoms, general signs, etiology, epidemiology, medical diagnosis, medical data and therapy in order to consider giving diet to patients. then the pretest scores will be compared andposttest score. The cases to be discussed are endocrine, kidney and cancer.

The assessment of student perfomance carried out in this case based method includes attitude score is seen from the assessment rubric which includes communication skills, material understanding, accuracy of case analysis, and ability to answer questions. While, knowledge seen from the quiz scores between before and after (pretest and postest).

3. RESULT AND DISCUSSION

3.1 AVERAGE VALUE IN THE CLASS INDICATOR OF BEHAVIOUR

According to Table 1, the behaviour of the students is divided into 5 categories; i.e., excellent, good, average, poor and very poor category, but There is no student who has poor and very poor value. Based on the data below in Tabel 1, we can see that each indicator of behaviour has different categories. The highest average value is in the indicators of interpretation which has an excellent category. The lowest average value is in the indicator of inference which has the poor category. The average value of the Ability to answer questions still in average category. In other hands, the indicator of communication skill, material understanding, and accuracy of case analysis have a close value with a small difference but still in the same category (Good).

Table 1. The category on the average value in the class indicator of behaviour

Indikator of Behaviour	Average value of the class		Category
	Mean	sd	
Communication skill	77,1	4,6	Good
Material	76,7	4,2	Good

understanding			
Accuracy of case analysis	76,1	4,1	Good
Ability to answer questions	65,7	4,3	Average

The ability to answer question is the indicator of behavior which has the lowest average value with the "average" category. Most of the students passed the learning process very well, but the fact does not show accordingly. After taking a closer look at the test results, the students who didn't ability to answer well because they didn't analyze well and still have low self confidence to speak. Although they had analyzed the problem well, they are having difficulty express theirs opinions.

3.2 Mean of pretest and posttest of knowledge students for endocrine disease, kidney disease and cancer case.

Test the normality of the data using Shapiro Wilk with a pretest value of 0.321 sig and a posttest value of 0.391, which means that the pretest and posttest values are normally distributed. Furthermore, pretest and posttest tests were carried out on students covering material on endocrine disease, kidney disease and cancer.

Table 2. Mean of pretest and posttest for each case

| Variabel | Mean ± SD | | Mean Differences | p-*value* |
	Pretest	*Posttest*		*(Sig 2 tail)*
Endocrine disease	70.7±5.2	72,2.±5.5	1.5	0,007*
Kidney disease	71,2±5,2	75.7±6.5	4.5	0,0000*
Cancer	70.2±5.3	83.2±7.3	13	0.0000*

The results of paired t test based on each case is listed in Table 1. The difference of the pretest and posttest of student knowledge scores showed significant differences in the all of the case (P<0.05). A significant increase in student knowledge is due to students having to read the material before lectures, besides that the case scenarios provided stimulate students to think critically and seek detailed information related to cases, both endocrine, kidney and cancer diseases.

4. CONCLUSION

The use of case based methods can improve knowledge of nutrition students, but they still were not able to answer questions well based on indicator of behavior.

ACKNOWLEDGMENTS

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