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Practice-Based Simulation Model (PBSM) and Demonstration: Comparison of Critical Thinking of Nursing Students in Clinical Skill of Diabetic Wound Care

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Abstract--- *Nurses must have critical thinking to provide good nursing care. Nursing education is important to support the student in achieving critical thinking skills to be a professional nurse. Learning methods that can be applied in laboratories to minimize undesirable events in hospitals and encourage students to think critically in making decisions are simulations and demonstrations. The purpose of this study was to determine the differences in practice-based simulation models and demonstrations of students' critical thinking in conducting diabetic wound care clinical skills. This research method uses a quasi-experimental design. Sampling with a purposive sampling technique with a sample of 42 respondents. Students are given a simulation method with three stages, namely briefing, conducting simulation, debriefing, while, for demonstration of the stage of material exposure, demonstration, and remonstration. Students given the practice-based simulation model have critical thinking with a mean of 54.43 and a demonstration with a mean of 42.62. The independent t-test found that the p-value is 0.000. There was a significant difference in students' critical thinking skills in performing diabetic wound care skills between the two groups. Students with simulation methods have a higher mean value compared to demonstrations. So students can apply the practice based simulation model as an innovative learning method in the laboratory to improve critical thinking if confronted with a case using simulated patients.*

Keywords--- *Practice-based Simulation Model; Demonstration; Critical Thinking*

I. INTRODUCTION

Efforts made by institutions of nursing education to improve the quality of education to make them as professional nurses require a learning process using clinical skills facilities [1]. Clinical skills laboratories need to be developed in every health education institution to respond to the development of the education system based on the new paradigm of using a problem based learning approach in the learning process [2]. Critical thinking in nursing education is an important component of professional accountability and quality nursing care. Nursing students are expected to be able to think critically to process complex data and make intelligent decisions about planning and management given the importance of these in decision-making, problem solving and clinical judgment [3].

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Diabetic wound care is one of the competencies that must be mastered by students. Diabetic wounds are infections, ulcers and or deeper tissue damage associated with neurological and vascular disorders in the limbs [4]. The role of the nurse is to perform wound care well and to assess and evaluate the perfusion of the injured tissue, assess the improvement of tissue granulation and assess the process of healing the gangrene wound [5]. To do this, wound care requires a learning method that can foster critical thinking where students can understand the case and be able to make the right decision when treating diabetic wounds.

Simulation methods if used in the laboratory can encourage students to use critical thinking in making decisions in overcoming problems without harming the real patient [6]. In research conducted by [6], the results obtained after the simulation found the attitude of students significantly improved in the intervention group ($p < 0.01$). The average attitude in the intervention group rose by 18.7 points and decreased by 8.2 points in the control group. In addition to improving critical thinking skills, simulation methods can also increase confidence in students as in research [7] which states that there is an overall significant increase in student confidence so that it can be a support for clinical learning models that use simulation methods to replace traditional methods. Previous study [6] said that simulation methods can improve clinical performance of students; however [8] states that simulation methods are indispensable for improving students' cognitive, affective and psychomotor skills. The demonstration method is a way of presenting learning material by demonstrating or showing students a particular process, situation or object that is being studied, either actual or an imitation, which is often accompanied by verbal explanation. The weakness in the demonstration method is that, if students are not active, then the demonstration method will be ineffective [9].

Simulation methods can encourage students to use critical thinking in making decisions in overcoming problems without harming actual patients [10]. [11] states that the simulation learning method is a method that presents lessons using real situations. The students are actively involved in interacting with their environment, while the demonstration method is considered to be very effective in helping students find answers and how to do it. This demonstration method will afford students a clear perception of the results of their observations, allowing them to gain practical experience, proficiency and skills [11].

The problems experienced by nursing students during the skills laboratory is diverse. The variety of learning methods that can be applied in the laboratory is the one of the solutions in enabling nursing students to achieve the goals. One of the indicators to be excellent in the skills laboratory is the critical thinking of the students. The nursing students will develop critical thinking through practice-based simulation models and demonstrations. The aim of this study is to know the differences in practice-based simulation models and demonstrations of students' critical thinking in treating diabetic wound.

II. METHODS

This research method uses a quasi-experimental design, sampling with a purposive sampling technique with a sample of 42 respondents. The inclusion criteria of the study were active undergraduate nursing students of sixth semester and had passed the prerequisite courses such as Basic Nursing Concepts, Basic Human Need, Anatomy, Physiology, Psychology, Nursing Communication, Health Promotion and Ethics of Nursing. The instrument used to measure students' critical thinking was a critical thinking questionnaire consisting of 17 statements, in which the questionnaire was adopted from the theory of [12]. Validity test was conducted at another nursing school at Semarang City with a total of 30 student respondents. The validity test results on the critical thinking questionnaire were from 20 statements that were tested, there

were 17 valid statements three invalid statements. Data analysis to find the difference between simulation and demonstration methods used independent t-test. Intervention on the simulation method was done by respondents by playing roles. Each time playing a role required three respondents, while other respondents were in the observation room. Respondents who had already done simulations were separated by those who had not yet done so.

The first day before the implementation, several step had to be followed, such as (1) Giving case scenarios and references to students. (2) Informing students related to the simulation room. Students acted as primary nurses and implementing nurses alternately by using hospital uniforms, all students prepared themselves by bringing material and references; for simulation patients a briefing was done regarding their role as patients.

On the day of implementation the procedure was as follows (1) A 15-minute briefing that consisted of some steps. First, ensuring all students were already in the simulation laboratory room. Second, reminding students not to eat and drink, and not to use stationery. Third, presenting case scenarios and learning objectives. Fourth, orienting three student participants in the simulation laboratory (the other students were in the observation room). Fifth, orienting students regarding patient information and bed functions. Sixth, introducing trained patients as patients in scenarios. Seventh, discussing with students the role of primary nurses and executive nurses. (2) The implementation of simulation for 12 minutes for every student. The facilitator activated the scenario and gave a signal to start or stop the simulation using the bell. In conducting the simulation, students were presented with a case scenario that raised unexpected events that are experienced by simulation patients and students were asked to take appropriate nursing actions in dealing with these unexpected events. After completing the simulation, all students were shared videos that had been recorded with the SHAREit program to be used in the debriefing process. (3) Debriefing was done for 45 minutes and consisted of facilitating interactive and interesting discussions by developing students' critical thinking in dealing with problem solving in the scenario. Then, students were guided to review / reflex the clinical simulation experience by involving students' reviewing points related to the intervention that had been done and discussing the process, results, and application of scenarios in DM wound care material using videos that had been recorded. This helped the students evaluate self-appearance, patient condition and patient response to interventions.

The intervention in the student demonstration method was divided into small groups consisting of eight to nine people. Inside the laboratory room, a foot mannequin with diabetic wound was presented. Students were guided by lecturers. The lecturer gave the concept of care first, and proceeded with a demonstration of diabetic wound care practice, and students tried one by one in carrying out diabetic wound care.

III. RESULT

Based on Table 1, GPA mean on students who use PBSM is 3.26 (of GPA max= 4.00), while the GPA mean on students who use demonstration method is equal to 3.14. In addition, it appears that male students have a higher rate of critical thinking than female students.

Table 1. Distribution of respondent characteristic based on Grade Point Average (GPA) and gender (n=42)

Variable	PBSM		Demonstration	
	Mean	SD	Mean	SD
Grade Point Average (GPA)	3.26	0.17	3.14	0.09
Gender				
Male	55.89	2.934	46.13	2.259
Female	53.33	4.942	40.43	3.314

The sample t-test showed that there were significant differences in critical thinking between PSBM and the demonstration method with (p) value= 0.000 (<0.05). It means that students that learn with PSBM gain a better critical thinking skill than others that learn with demonstration method (see Table 2).

Table 2. Statistical result (by independent sample t-test)

Variable	Mean	t	df	Significance value
PBSM	54.43	9.363	40	p= 0.000
Demonstration method	42.62			

IV. DISCUSSION

The results of data recapitulation are shown in Table 1.1. The average GPA score for students using the PBSM method is almost the same as the GPA for students who use demonstrations. Learning achievement is the result obtained after a series of learning processes, which can be quantitatively demonstrated by the value or number given by the educator to the subject of learning concerned. That is, learning achievement is a reflection of the results obtained during the learning process [13].

There is a policy at the institution where this study was conducted by which students in the sixth semester must have a GPA for a minimum of 3.00 as a requirement to be able to take a thesis proposal credits. While, at present, hospitals that require both public and private health workers set a minimum GPA of 3.00 to be able to participate in the selection of prospective health staff employees, in other words, students of the Faculty of Nursing will tend to more easily compete in the world of health given the value of the GPA has met the minimum limit set.

Research conducted by [14] showed the ability to think critically has a positive and significant effect on student achievement in class XII in economic subjects at SMA N 8 Padang, which is indicated by a coefficient value of 0.672. This coefficient value is significant because, a value of t-count, 4.244> t-table of 1.661 means that, if critical thinking skills increase by 1%, then learning achievement will increase by a coefficient value of 0.672 in each one unit.

Based on the recapitulation of data in Table 1.2. gender results obtained both in students who use PBSM and students who use demonstrations have the highest mean value in male gender. Gender can affect a person's self-confidence and is one of the basic categories in social life. When meeting new people, you will unquestionably try to identify someone as a man or a woman. In previous study, [15] showed that there is a relationship with a low level of gender with the ability to solve problems. A low relationship indicates that gender does not significantly affect the ability to solve problems, so it is suspected that there are other factors that also play a role in this Previous research [16] obtained results that there is no difference in confidence in terms of gender of students. This proves that,, in making a presentation, self-confidence is not influenced by the sex of students when speaking in public. There is no difference between male and female students in determining their respective roles according to their gender, so they can form a self-concept that can provide a major influence on the formation of student confidence

The results of the data recapitulation in Table 1.3 show that the students who used the demonstration method in this study had a mean increase, but students who used PBSM increased significantly more. In Bloom’s taxonomy, it is in the cognitive domains C4, C5, and C6 where this ability can be achieved if students are able to analyze in distinguishing patient data from normal values as a comparison, can differentiate existing data gaps so they can judge in conducting assessments on patient problems and can conclude the intervention in accordance with the patient's condition, and then can

plan interventions that have been determined. In the affective domain which lies in A3 and A4, students assess by completing both subjective and objective data in making assessments so they can manage cases and can solve problems that occur in patients. In the realm of psychomotor, which is in P2, this is identifying problems in patients so that they can demonstrate interventions that have been determined.

Critical thinking is one of the higher order thinking skills that requires conscious thinking skills. Therefore, students need to be trained so that they are able to express the reasons for the relationship of a thing and be able to make structured solutions. Practice-based simulation models affect students' critical thinking because, in the simulation model, students are trained to think critically in solving problems presented with real cases by adding psychological, social and emotional cases. Students are asked to analyze clinical situations, to formulate appropriate interventions and evaluate nursing care actions that have been taken. The simulation process is done with a flow: a 15-minute pre-briefing, then after pre-briefing, students do the simulation of the scenario that has been presented for 12 minutes, and then spend 45 minutes debriefing. Lecturers in the simulation method act as facilitators to discuss scenarios related to case scenarios. The facilitator helps students understand and develop the knowledge and skills that should be done.

The case scenario that has been presented makes students think actively to look for the solution process. In this problem solving process, students will be motivated to investigate deeper, so they can build their knowledge independently and high-level questions arise that indirectly train them for critical thinking. This is in line with the opinion of [17], who states that problem-based teaching is a learning approach where students work on authentic problems with a view to compiling their own knowledge, developing inquiry and higher-level thinking skills, developing independence and self-confidence.

The improvement of students' critical thinking skills is also inseparable from the change in their habits of memorizing and imitating each action taught by the lecturer for understanding analyzing case scenarios presented to perform nursing actions so as to evaluate the results of actions taken on DM wound care material. This simulation experience will be more meaningful than lecturers only presenting information and modeling actions. This is in line with the opinion of [17] who states that from examples of real problems, if solved in a real way, it allows students to understand concepts not just memorize concepts.

In the simulation process with a time of 12 minutes, each student to completed two nursing actions, namely to overcome the main problem complained of by the patient and overcome unexpected events in the patient, There were some students unable to complete within 12 minutes, because they did not know what to do when facing unexpected events in the patient's condition. In the debriefing process in the first week, in guiding students to reflect on themselves with videos that had been recorded, students were still not accustomed to evaluating themselves guided by the lecturer.

At the end of debriefing, many students said they were more pleased with the practice-based simulation model method because they could explore the knowledge and skills used by students, use simulation patients so that they could be more interactive in communication and when doing wound care students were more interactive because they could do the debridement sensation directly on meat and skin that has been formed into a real wound. In a previous study, [18] showed that the simulation method has an effect on students' criticism. According to [19] , when students are given problem exercises, the ability to answer questions can be improved. This is in line with research conducted by [20] stating that, when students are given problems in the form of problem exercises and demanded to be able to solve problems, indirectly the ability to answer questions will increase. This statement is in line with research conducted by [19] that critical thinking skills will not develop if not trained, so students need practice, practice and patience. [20] Simulation is

one of the learning methods that can affect critical thinking skills and confidence of nursing students . [21] believes that simulations can be used as learning experiences that encourage students to develop critical thinking skills and help students become more competent in patient care and with patients in complex conditions.

Changes in learning outcomes are a result of the learning process that has been passed. Achievement of learning outcomes in both groups is not only the result of the learning process in the classroom, because there are extrinsic and intrinsic factors. Intrinsic factor is the past experience of learning or learning through past experience. This factor is reinforced by Dewey's theory that learning is a process of reconstructing and reorganizing experiences. According to this theory, prior knowledge possessed by students will influence in terms of student understanding of the material during lectures. Students who use the demonstration method are thought to have good prior knowledge so that, in the first posttest and second posttest, they experience an increase in the learning experience.

Demonstration method is a method that presents procedures on how to use tools and how to interact with clients. In its implementation, the emphasis on objectives and points is the focus of attention. The purpose of this method is to get an overview of things related to the process of organizing, making, the process of working, comparing a way and knowing and seeing the truth of something [11]).

In a previous study [22], when the lecturer explains and demonstrates the feeding lab skills to the baby through the nose (NGT) students are occasionally asked what is not yet clear and this gives students the opportunity to ask questions and re-demonstrate, then the lecturer as a mentor accompanies and guides. If students succeed in performing a skills lab skill that has been taught, then lecturers give praise or plus value to students. After conducting the demonstration, Supervising lecturers asked students to go ahead with the re-demonstrations alternately, each consisting of two students until the learning time was complete. But from the results of observations and interviews, not all students were told to try (only two or three tries by two or three students only). According to the study, the implementation of the skills lab learning with the demonstration method is that, if not all students are asked to try to repeat what has been taught, then learning will not be effective. A result of systematic review conducted by [23] stated that the demonstration method increases nursing student ability.

The demonstration method that has been taught at Faculty of Nursing Sultan Agung Islamic university indirectly provides knowledge related to the material to be simulated, so that it can trigger critical thinking in the control group. The difference in practice-based simulation models is that, when students are exposed to cases that use simulated patients and ordinary mannequins this a difference, namely students have a better ability to communicate and are able to see the patient's response directly. In the case of simulation, students are presented with unexpected events experienced by patients, so students must think what how to respond to these. In the demonstration method they only repeat the actions that have been taught by the lecturer in order. At the end of the simulation session, a debriefing is conducted where students one by one evaluated the performance by reflecting on themselves using a video guided by a lecturer who had assessed it via a CCTV camera. Students are asked to issue ideas and opinions related to the work done. In the demonstration method, the lecturer also gives feedback related to the material, but only a few students usually ask about the material that has been studied.

In line with the opinion above, [24] states that the demonstration method can stimulate students to be active in observing, adjusting theory with reality and trying to do it themselves. Thus, students will be able to observe directly so they can understand the explanation better and minimize the possibility of misunderstanding. [25] stated that the use of demonstration methods can increase learning motivation in students as indicated by the increasing desire of students to

learn and participate actively in learning to get changes toward a better direction. So, it can be concluded that the critical thinking of students in the process of diabetic wound care is more significant using the PBSM method compared to the demonstration method.

V. CONCLUSION

There was a significant difference in students' critical thinking skills in performing diabetic wound care skills between the two groups. Students with simulation methods have a higher mean value compared to demonstrations. Therefore, it would be better if nursing education institutions provide this learning method more in order to improve the nursing student competencies, especially in critical thinking skills.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

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