

The Effectiveness of a Low Cost Hybrid Simulator Model in Achieving Clinical Skills of Third Trimester Pregnancy Examination on Midwifery Students of Polytechnic of the Ministry of Health of Riau in Pekanbaru

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Abstract—The use of hybrid simulator in clinical learning of pregnancy examination is necessary to increase the skills of students. However, the lack of availability and limitation function of the hybrid simulator hinder the process of clinical learning. The purpose of this research is to develop a low cost hybrid simulator in achieving clinical skills of pregnancy examination. This research is an R&D research model with the development of ADDIE. The subjects of this trial are second year midwifery students of Polytechnic of the Ministry of Health of Riau, and midwives/CI in four maternity hospitals in Pekanbaru. Data of the research consisted of quantitative and qualitative data. The quantitative data was from the result of pre-test and post-test dan the qualitative data was from the result of group discussion forums. The result of this research showed the sign value < 0,05 meant there were a difference between pre-test and post-test using low cost hybrid simulator. The average result of pre-test was 68,27, meanwhile the average result of post-test was 84,94. Low cost hybrid simulator can be used as a learning media to increase clinical skills of antenatal care.

Keywords—*Hybrid Simulator Model, Clinical Skills, Midwifery*

I. INTRODUCTION

Clinical education in midwifery education aims to integrate theoretical knowledge from books into clinical skills in real-life situations and to help students develop skills in clinical practice for their problem solving. Due to patient safety and ethical concerns, students' direct experience with patient care and opportunities to handle problem-based clinical situations has been reduced. Simulation-based clinical education is a useful pedagogical approach that provides midwifery students the opportunity to practice their clinical and decision-making skills through a variety of experiences in real-life situations, without compromising patient well-being. Simulation according to the Big Indonesian Dictionary,

2016 (KBBI) is a training method that displays something in an artificial form that is similar to the real situation.

Simulation-based clinical education in midwifery education refers to a variety of activities that use a patient simulator, including devices, trained people, living virtual environments, role playing, and use of mannequins. With realistic clinical scenarios, simulation-based educational interventions in Midwifery Education can train aspiring midwives to be experienced, helping them develop effective non-technical skills. The advantages of simulation-based educational interventions include the ability to provide direct feedback, repetitive practical learning, integration of simulations into the curriculum, the ability to adjust difficulty levels, opportunities for individuals to enhance learning, and adaptability to different types of learning strategies (Issenberg SB, et al., 2005; 27: 10–28).

Simulation can be described as a series of activities ranging from low fidelity simulations to high fidelity simulations. Munshi, F., et al., (2015) Various simulation methods can be adjusted according to specific learning outcomes and education levels. The required learning outcomes must regulate the choice of the simulation method. Toserud R, et al., (2013; 13: 262–70) A number of research studies in Midwifery have evaluated the effectiveness of simulation-based educational interventions. However, reported effectiveness varies according to the level of simulator fidelity and the outcome variables. High-fidelity simulators are declared effective for learning in health sciences, such as midwifery.

Simulation training is today considered one of the most common and important educational methodologies. Rutherford-Hemming, T., et al., (2012) As an innovative approach, simulation training has become very popular in midwifery education because simulation training matches

the demands of future midwives through complementary traits (Cooper, S. , et al., 2012).

Practicing skills using a variety of models has been a part of midwifery education for many years and is an increasingly important tool for continuing primary education and health professions. Simulations also provide opportunities for lecturers to teach and evaluate student performance in realistic situations. Pregnancy simulator is an anatomical model designed for teaching skills needed to help a woman who is having her pregnancy checkup. This pregnancy check-up simulator provides students with realistic opportunities to practice hand maneuvers to check for normal or complicated pregnancies. Simulations with the midwife team in antenatal care will reduce midwife errors, increase knowledge, improve communication and teamwork skills, and improve antenatal care skills.

The use of a hybrid simulator (hybrid simulator), which is a combination of standard patient and simulator, allows students to practice and demonstrate affective skills and procedural skills in the context of the same simulated patient care. Herajy, M., et al., (2017) Hybrid simulations are particularly effective for teaching and assessment in scenarios that require high levels of procedural accuracy and emotional sensitivity. Kneebone R, et al., (2002; 36 (7): 628-634) Given the complexities of pregnancy, hybrid simulation offers an ideal modality for constructing simulation scenarios.

This research will focus on making a hybrid pregnancy examination simulator with materials that are very easy to obtain, namely in the form of sewn fabrics. The resulting product will prioritize the aspects of appropriate technology, namely technology designed in a particular society so that it can be adapted to the environmental, ethical, cultural, social and economic aspects of the

II. FORMULATION OF THE PROBLEM

In the research, it has been stated that teaching aids for pregnancy examinations are not cheap so that repetition or repetition of clinical studies on antenatal care cannot be done as much as possible. Hence, it is an inexpensive but realistic and repeatable antenatal care simulator without harming the user

need to be created. Therefore, this study tries to raise the problem of cheap antenatal care simulators for midwifery students in achieving clinical skills in third trimester antenatal care.

III. RESEARCH PURPOSES

To find out the effectiveness of a hybrid pregnancy examination simulator with appropriate technology that can be used repeatedly and is not harmful to users (simulated patients) and midwifery students.

IV. BENEFITS OF RESEARCH

The final product in the form of a pregnancy examination simulator will provide significant benefits, especially for students who want to be competent in the clinical skills of antenatal care.

These benefits include:

- Provides an affordable pregnancy examination simulator for students who want to try out the clinical procedures of antenatal care assessment skills,

community concerned. The community referred to in this study are midwifery students who desperately need simulators or teaching aids for pregnancy examination clinical skills. The economic aspect that is the target in the manufacture of this product is the low-cost concept so that the resulting simulator can be provided by midwifery institutions in sufficient numbers to become a teaching aid in learning clinical skills for pregnancy examinations.

Based on a preliminary study, the researcher with 15 students of D III Midwifery Study Program at Stikes Payung Negeri Pekanbaru said that the props available for pregnancy examinations available in the old panthom laboratory were rather stiff and could not determine the part of the fetus, nor could they determine uterine fundal height, and when the pregnant panthom is opened, then you know the position of the fetus in the panthom, so that when practicing in the laboratory, you do not immediately know what is in the panthom.

Intellectual Property Rights (IPR) is the final product of this research with a finished product in the form of a pregnancy examination simulator. The low-cost motto is a priority for the superior products produced in this study when teaching aids sold in the market are expensive and, for this reason, students become afraid when using them so that the repetition of clinical skills procedures that should be done by students as many times as possible cannot be carried out properly. For this reason, this research is expected to be one of the leading works that will set an example of the creativity of midwifery lecturers with the title "The effectiveness of Hybrid Simulator Low cost teaching aids in achieving clinical skills in 3rd Trimester Pregnancy Examination of Midwifery Students of the Riau Ministry of Health Polytechnic in 2019".

- Provides a realistic antenatal care simulator so that the experience of assessing antenatal care in a clinical simulation can feel real.
- Motivate other researchers to be able to make or develop tools with cheap raw materials but can give a realistic and durable impression.

V. LITERATURE REVIEW

Students who use mannequins in lab simulation scenarios turn the mannequins into real patients. In this case, students noted that the simulation gave them confidence that they developed skills and knowledge to perform the tasks required for clinical skills, and that they achieved the goal of learning simulation. Students who took simulation training performed better on psychomotor skills and expressed higher levels of self-confidence than students who did not take simulation training.

Kneebone et al., (2002; 36 (7): 628-634) used hybrid simulations integrated with standardized / standardized patients to teach urine kinetization and wound closure skills. They found that the integrated model was worthy and valuable by students. In addition, students also noted that they saw hybrid simulation as an opportunity to integrate, in a safe environment, communication and clinical skills, which are often taught separately.

Students may also demonstrate a higher level of communication skills in clinical practice with standard

patients than in the lab. Hybrid simulation facilitates the simultaneous acquisition of technical and communication skills, and hybrid simulation methods help achieve cognitive and affective learning outcomes. Hybrid simulations designed to teach technical skills are effective and useful in achieving learning outcomes. In conclusion, the training conducted using the hybrid simulation method has advantages and benefits for students.

A. Standardized / Standard Patients

In health care, a simulated patient (PS), also known as a standard patient, sample patient, or patient instructor, is an individual who is trained to act as a real patient to simulate a series of symptoms or problems. Simulated patients have been used successfully for education, evaluation of health care professionals, basic, applied and translational medical research. Standard patients can also contribute to the development and improvement of health care protocols; especially in cases where input from standard patients is based on extensive experience and direct observation as clinical patients undergoing care.

Dr. Howard Barrows trained the first standard patient in 1963 at the University of Southern California. This standard patient simulates the history and examination findings of a patient with paraplegic multiple sclerosis. Dr. Barrows has also developed a standardized checklist that patients can use to evaluate trainees' performance. Paula Stillman trained a standard set of patients in 1970 at the University of Arizona. Its pilot program has local actors portray "mothers" of imaginary children. The actors will portray a disease afflicted by an invisible child, requiring medical students to take a history to develop a

differential diagnosis based on the testimony of the mother. In 1984, a number of residency programs in the northeastern United States provided residents with the same examinations using standard patients. The Medical Council of Canada was the first to use standardized patients in licensing examinations in 1993.

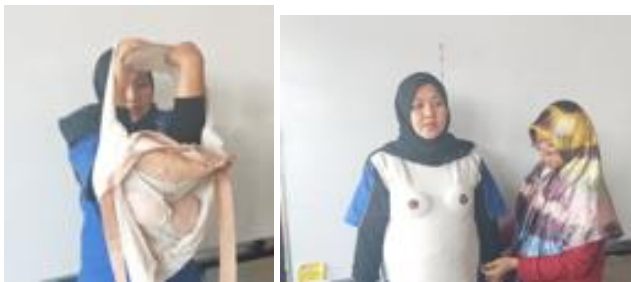

The use of standard patients has several advantages. Standard patients with extensive clinical outpatient experience will have hands-on knowledge and experience of the clinical outpatient environment, which should have an advantage over professional actors who must learn how to "play the role" of a clinical patient. The standard patient is able to provide the required cases when needed. They tend to be more reliable, and can tolerate more college students than real patients. The use of standard clinical scenarios allows direct comparison of student clinical skills, both local and national and international. Standard patients can provide a longitudinal experience and allow students to follow the patient over time, even within compressed examination durations.



B. Pregnancy Test

Regular pregnancy monitoring allows early detection of health problems that can arise during pregnancy, and their care, thereby increasing the chances of a normal pregnancy and the birth of a healthy baby. The information below relates to which tests to recommend during pregnancy for women without risk factors. The information detailed below provides only all information related to pregnancy and examinations during pregnancy.

VI. RESEARCH RESULTS

TABLE I. RESEARCH RESULTS

<p>DEVELOPMENT STAGES WITH EXPERT VALIDATION AND REVISION</p> <p>Making stage 1: VALIDATION</p> <p>Expert: it's hard to pair it. If it is installed, it looks like a pregnant woman, the inside of the uterus is in accordance with the size of the uterus of the pregnant woman per semester. Suggestions for improvement:</p> <ul style="list-style-type: none"> - on the back of the model so that it can be made like a rope for easier installation and opening <p>This t-shirt material makes the model more elastic and press. If possible made with ordinary materials in order to reduce costs because this t-shirt material is not available for sale in Pekanbaru</p> 	<p>Results of FGD in research models for examination of pregnant women in PMB 'Siti Julaeha' Pekanbaru</p> <p>Can the model attached to the simulated patient give the impression of a pregnant woman?</p>  <p><i>'suitable ..., maybe the size is better there is an S-M-L size. If this is used by him (while pointing at students who practice) it is just right, but if used with the same, it is big). that's pretty good looking like pregnant women, especially those who are pregnant). If the little pregnant is not visible yet. We think it's only natural, when pregnant women are young they haven't seen a lumpy stomach.</i></p>
<p>The results of the FGD in the research model for the</p>	<p>FGD results in a model study for examining</p>

<p>examination of pregnant women at the Clinic 'Afiyah' Pekanbaru Can the material and structure of the model injure the simulated patient when used?</p>  <p><i>It's impossible for the one to get hurt, from the cloth... the same as the material we wear everyday (while holding the material)... using foam again so it's definitely safe. This is very similar to ordinary clothes... you can wash it, ma'am (while asking). It's good, ma'am, can be washed, folded, don't bother saving '</i></p>	<p>pregnant women in PMB 'Hj. Dince Safrina' Pekanbaru Can the model attached to the simulated patient give the impression of a pregnant woman?</p>  <p><i>"It looks like a pregnant woman, especially after wearing a negligee ... the more it looks like". But ... if the uterus is small it is less visible.</i></p>
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The results of table 1. The significant value of p value <0.05 (significant level 95%) means that there is a significant difference or influence between the pre-test and post-test using the low cost hybrid simulator. To see the effect before (pre-test) and after (post-test) using a low cost hybrid simulator used paired sample t-test. However, because the pre-test and post-test data obtained were abnormal due to outliers, and data transformation was carried out to overcome the outliers, the results obtained still showed that the data were not normally distributed. Based on this, researchers used the Wilcoxon test to see the effect of before (pre-test) and after (post-test) the use of a low cost hybrid simulator on data that were not normally distributed.

Based on the results in class, all students' scores on the posttest seemed to improve with an emphasis on one component of the assessment, namely the mention of the uterine fundal height of pregnancy. This is evidence that the results of the study in the form of teaching models for pregnancy examination from two models (old and new) provide significant differences in results. Based on random interviews with previous students, the difference in the ability to mention the height of the uterine fundus is based on the fact that the old model cannot be used to assess the height of the uterine fundus, while the touch in the new model gives a clear impression of a felt fundal height.

The second difference that gives different results in student scores is the communication that can be made between midwives (students) and patients (simulated patients who are grafted with a new simulator). Students feel the real clinical situation obtained in the posttest involving simulated patients.

The determination of the uterine fundal height is very important in antenatal care because, from a palpable fundal height, an estimate of the fetal weight (TBJ) will be carried out. Therefore, clinical learning model of pregnancy examination in trimesters 1, 2, and 3 must be made as precise as possible so that learning outcomes can be achieved as well as possible. This is in accordance with the objectives of the instructional design model (ADDIE), (Cheung, L., et al., 2016) which is to help educators ensure that they teach the right material optimally, or to

provide the right purpose, and the right path. to bring the direction of learning achievement. Here, the tasks that must be performed by learners, as well as the knowledge, skills, and attitudes they need, are defined and broken down into components. This, in turn, will inform the learning objectives.

However, in accordance with the principles of appropriate technology, learning aids should also cover at least the following four categories: cheap, realistic, durable, and safe ... Realistic and highly durable but cheap and safe tools are absolutely necessary in clinical learning students, especially midwifery students who are the focus of our research.

VII. QUALITATIVE

A. Cheap

Teaching aids that are inexpensive but have good quality are very much needed in the world of teaching and training in certain health skills, such as pregnancy examinations in the 1st, 2nd and 3rd trimesters with special specifications on the touch of the fundus area to determine the TFU (height of the uterine fundus) the basis of obstetrics in determining estimated fetal weight (TBJ). While the tools required for simulating health scenarios (with simulated patients) are inexpensive, procuring these tools will be less difficult for certain institutions. Therefore, by being said to be cheap, the model in this study can be categorized as 'low-cost' because the only materials used are cotton, dacron, and foam which are relatively easy to find.

B. Realistic

From the students' opinions carried out at the quantitative and qualitative research stages after students were given exams with a pretest and posttest using two different tools (pretest with old tools and posttest with new tools), this pregnancy examination clinical learning model product can be categorized as realistic. teaching or training aids. Realistic impression is very important to be highlighted in making products as teaching aids because trainees or students can imagine real situations or anatomy from humans. In the world of health education, simulations offer good coverage for the training of interdisciplinary medical teams. Realistic scenarios and equipment make it possible to retrain and practice until

one can master the procedure or skill. More and more health institutions are now turning to simulation-based learning.

C. Durable

Both students and practicing midwives stated that they were not afraid of breaking the device because the models made were made of durable cloth. A durable tool or simulator is needed by students or trainees so that they can practice repeatedly until they are truly proficient with the skills they are learning. Medical teaching aids or training simulators must be flexible and durable. Repetition or repetition is a very important part in learning a skill, without exception determining the height of the uterine fundus in pregnancy examinations in the 1st, 2nd, and 3rd trimesters. With this durable or durable model, the procurement of a simulator model is not done frequently because of worn not easily damaged.

D. Safe

When the products used for teaching aids are considered safe, midwifery students as the focus of this research who will later use the teaching aids developed in this study can comfortably use the model to master the skills being taught. Product safety includes in terms of materials used, sharpness of tools, which may occur. This product does not contain any dangerous ingredients, does not have a sharp surface or edge, and is easy to carry because it is a fabric (light).

With the opinions of students and midwives practitioners, this product can be categorized as an appropriate technology product. The R&D (research and development) research carried out using the ADDIE instructional method is expected to encourage other researchers in making teaching materials or clinical teaching aids to advance midwifery education, in particular, and other health education, in general, so that more graduates are produced. competent because they can practice clinical skills with high reps.

VIII. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusion

The development of learning media in the form of a low cost hybrid simulator with appropriate technology can help improve the clinical skills of antenatal care, especially for determining the height of the uterine fundus in pregnant women. With the development of a low cost hybrid simulator that is durable, realistic, safe, has similarities to the real patient so that it is effectively used to assist in the smooth running of student practicum activities, as well as to provide convenience in providing pregnancy examination tools.

The results of the low cost hybrid simulator product implementation trial showed a significant change in the increase in the average pre-test result from 74.78 to 84.94 in the post-test result. This shows an increase in clinical skills of students, especially in determining the height of the uterine fundus in the third trimester of pregnancy examination using a low cost hybrid simulator.

B. RECOMMENDATIONS

With the creation of tools with the principles of appropriate technology, suggestions that can be conveyed

to readers, especially midwifery and other health lecturers, are:

- Lecturers or clinical instructors in the field of obstetrics and other health should be more creative in creating or developing a low cost but high quality clinical skills teaching aid.
- Lecturers or clinical instructors in the field of midwifery and other health must be able to show creativity, not only always in creating or developing teaching aids for clinical skills, but also in other matters such as educational curriculum innovation, developing learning methods, developing book materials. teach that is easy to understand, etc.
- The government continues to support the creativity of lecturers when the lecturer is able to create or develop a teaching aid for clinical skills by further facilitating these creativities because a person's creativity can be more expensive and more difficult to find than the material.

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