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Low Fidelity Prototype Uterus Model - Initial Design of Uterus Organ Product as Learning Media for Handling Postpartum Hemorrhage

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ABSTRACT

Background & Aims: Professionalism and competence of midwife graduates begins with the educational process that is carried out with all human resources and existing facilities and infrastructure including learning media for handling postpartum hemorrhage. This study aimed to create an innovative uterus model as a learning medium for handling post-partum hemorrhage. **Methods:** The research method used research and development (R&D) referring to the 4D model namely define, design, develop, and disseminate with 120 respondents from midwifery institutions in Surabaya. **Results:** The results of the research from the define stage obtained information that the uterus model learning media for handling post-partum bleeding due to uterine atony and placental retention used was still inadequate. At the design stage, the Low Fidelity Prototype of the Uterus Model was obtained, namely in the form of a Sketch of the Uterus Model Product which serves to develop the product design scheme until it finally becomes the final product "Uterus Model". The uterus model media is designed with characteristics: resembles the original picture, resembles the shape of the uterus, transparent/translucent, spongy consistency, easy to obtain materials, the part in question (placenta) in the uterus appears from the outside and is a new product (not a copy of an existing model). **Conclusion:** The existing uterus model as a learning media has not been able to provide an actual picture. The existing uterus model as a learning media has not been able to provide an actual picture.

Keywords: Learning media, Uterus model, Management of hemorrhagic post-partum

INTRODUCTION

One of the causes of the highest maternal mortality rate (MMR) is Hemorrhagic Post-Partum (HPP) and midwives are one of the health workers who play a role in reducing maternal mortality (1). Hence, midwives should work professionally in accordance with their competence and authority. To actualize a professional midwife begins with the educational process, where the competence of graduates has been determined by the curriculum that will bring consequences to the management of learning as ideal as possible (2). The authority of midwives is physiological, detecting and initial handling of maternal emergencies before being referred. Midwives should professionally work in accordance with their competence and authority, carrying out comprehensive and quality midwifery care in maternity and postpartum women, emergency conditions and referrals (3).

Management of postpartum hemorrhage with bimanual compression due to uterine atony and manual placenta due to placental restensio is included in the Maternal and Neonatal Emergency Obstetrics Course with the subject matter of managing labor complication actions in times III and IV (4). The learning process

in higher education should refer to graduate competencies. Five important components affect the effectiveness of the learning process, namely goals, materials, methods, media, and learning evaluation. The selection of appropriate learning media will affect motivation, conditions, and learning environment. Media is one of the factors that support the success of the learning process at school because it can help the process of delivering information from teachers to students or vice versa.

Using media creatively can facilitate and improve the efficiency of learning so that learning goals can be achieved (5). The results of a preliminary study of 10 students in the 8th semester of Applied Midwifery Polkesbaya who have practiced postpartum hemorrhage management, 100% of the students said that the existing uterine model media was inadequate and did not have a real understanding and picture. Based on this background, an innovative uterine model is required so that students will have adequate learning experience to produce competent laboratory skills, positive attitudes and be ready to apply them when practicing in real settings and have an impact on graduate competence.

The novelty in the research lies in the innovation of designing and making uterine model products as learning media for handling postpartum hemorrhage due to uterine atony and placental retention. Uterine model products are designed with characteristics resembling the original image, resembling the shape of the uterus, transparent/translucent, spongy consistency, easy to obtain materials, the intended part (placenta) in the uterus appears from the outside and new products (not a copy of an existing model). The purpose of this study was to create an innovative uterine model as a learning medium for handling post partum hemorrhage. The urgency of this research is to create a uterine model with special specifications of uterine models resembling actual conditions that will make it easier for students to achieve competence in handling post partum hemorrhage.

RESEARCH METHOD

This research uses Research and Development (R&D) method to produce certain products, test the effectiveness of the product in order to work in the community, by referring to the 4D model, which consists of the define, design, develop and disseminate stages. The Define stage, is the initial stage of data collection from 120 research samples of Midwifery students (Bachelor of Applied Midwifery semester 8, Bachelor of Midwifery semester 8 and Professional Midwife semester 1. The research location is in Surabaya. This place became the center of the development and testing of uetrus products. At the Design stage, the design of the uterus model device was prepared. To produce uterine products in this study, Focus Group Discussion (FGD) was conducted which was attended by Sp.OG doctors, consultant radiology doctors, image designers and manufacturers (Partners). The Develop stage produces a revised uterus model portfolio-based assessment tool based on expert input and trial results. This stage includes device validation by experts, revisions, and trials. The Disseminate stage tested the effectiveness of using the device.

RESULT AND DISCUSSION

Table 1. Description of respondent information data on existing uterine model media as a learning tool for handling HPP with IBC and manual placenta in midwifery programs in Surabaya in 2024

Option	Assessment					Total
	No	Less	Almost	Clear	Very Clear	

	f	%	f	%	f	%	f	%	f	%	f	%
The uterus model resembles the shape of the uterus	4	3,33	29	24,17	59	49.17	25	20,83	3	2,50	120	100.00
The inside of the uterus model can be seen	28	23,33	57	48,00	22	18,33	11	9,17	2	1,17	120	100.00
The shape of the uterus model after giving birth	7	5,83	52	43,33	32	26,67	23	19,17	6	5	120	100.00
Pressure on the anterior fornix is visible	24	20	40	33,33	42	35	9	7,5	5	4,17	120	100.00
The uterus model can be folded	4	3,33	52	43,33	26	21,68	34	28,33	4	3,33	120	100.00
The obstetric hand shape changes to a fist shape are visible	21	17,50	49	40,83	35	29,17	15	12,50	0	0	120	100.00
The placenta is visible in the uterus model	30	25,00	32	26,67	27	22,50	21	17,50	10	8,33	120	100.00
The bleeding is coming out of the vaginal introitus	54	45,00	29	24,16	23	19,17	14	11,67	0	0	120	100.00
The hand combing of the uterus is visible during manual placenta	24	20,00	42	35,00	22	18,33	30	25.00	2	1,67	120	100.00
The placenta is visible during manual placenta	36	30,00	35	29,17	13	10,83	27	22,50	9	7,50	120	100.00

The define stage is the step of analyzing and identifying problems to obtain various information related to the product to be developed. The uterine model used as learning media in handling. Student assessment of the uterine model media used on campus for handling Post Partum Hemorrhage due to uterine atony with internal bimanual compression (IBC) and placental retention with manual placenta.

Table 1 shows that 49. 17% almost resembled the shape of the uterus, 48% the inside of the uterus was less visible, 43.33% the shape of the uterus was less helpful for understanding, 35% almost saw the emphasis on the fornix, 43.33% the uterus was less able to fold, 40.83% did not see the change of hands from obstetric to fist shape during KBI, 26.67% did not see the placenta inside the uterus, 45% did not see the blood coming out of the vaginal introitus, 35% did not see the hand sweeping of the uterus during manual placenta and 30% did not see the release of the placenta during manual placenta. Based on the results of interviews and suggestion forms regarding the existing uterine model, it was found that respondents had difficulty understanding objects in the form of Internal Bimanual Compression ("IBC") when the helper's hand enters the vagina obstetrically and then turns into a fist until it reaches the anterior fornix and during Manual Placenta, which is the entry of the helper's hand into the vagina to the uterus looking for the loose placenta.

The design stage aimed to prepare guidelines in the design and production of uterine model media. This design is made based on the results of Focus Group Discussion (FGD) on the scope of the topic of uterine model learning media used in the handling of post partum hemorrhage due to uterine atony with bimanual compression and placental retention with manual placenta. To produce learning media, the uterus model and placenta model that are developed must meet the characteristics of resembling the shape of the uterus, being transparent/translucent, spongy consistency, easy to obtain materials, the part in question (placenta) in the uterus is visible from the outside and a new product (not a copy of an existing model). The model made can be used as a substitute for the original model, facilitate understanding of the object, facilitate the delivery of explanation/information, clarify an explanation, facilitate describing an object, cheaper and more efficient and because it is

difficult to display the original then need a mock model. In developing the uterus model, Magnetic Resonance Imaging (MRI) is performed to produce a picture of the original uterine organ. The result at this Design stage is the Low Fidelity Prototype Uterus Model in the form of a Uterus Model Product Sketch which serves to develop a product design scheme until it finally becomes the final product "Uterus Model".

The results showed that from the assessment of the existing uterine model as a learning medium for handling postpartum hemorrhage due to uterine atony with Internal Bimanual Compression (KBI) and placental retention with manual placenta, the uterine model was inadequate and had difficulty understanding the object in question.

Learning media are all sources used to deliver messages, stimulate students' thoughts, feelings, attention, and willingness, so as to encourage students to learn. Media and learning resources are said to be of high quality if: 1) Can create a meaningful learning experience, 2) Able to facilitate the process of interaction between students and teachers, students and students, as well as students, with relevant experts in the field of science and the surrounding environment, 3) Media / learning resources can enrich students' learning experience, 4) With media/learning resources, able to change the learning atmosphere from passive students and teachers as the only source of knowledge, to become active students in discussions. Media is said to be effective if it can create meaningful learning experiences, able to facilitate interaction between students-teachers, students-students, students-competent people (6).

Midwife graduates must be competent in early detection and early action of maternal emergencies due to postpartum hemorrhage due to uterine atony and placental retention and must be resolved immediately to prevent maternal death. Therefore, the learning experience of students during education will produce the

competence of graduates needed by the community, the right and adequate uterine model media is needed, namely a substitute for the original model, facilitating the understanding of objects, facilitating the delivery of explanations/information, clarifying an explanation, making it easier to describe an object, cheaper and more efficient, because it is difficult to display the original, a mock model is needed (7).

Practical activities using appropriate learning methods and media will lead to the formation of student skills and creativity in receiving knowledge. In midwifery education institutions as one of the places to gain learning experience, effective and efficient learning strategies are needed to improve the competence of graduates. Efforts are made by educational institutions, by increasing the competence of human resources, laboratory infrastructure including media. Learning media for uterine models of postpartum hemorrhage handling have been widely developed in midwifery education institutions, but are still inadequate. Adequate learning media can be used to stimulate thoughts, feelings, attention and abilities/skills of learners so as to encourage the learning process (8).

Clinical skills training with simulation using tools or models (skill lab) can fulfill two needs and challenges in health care and education at once. Skill training on models can increase safety and reduce errors made in practice with patients at a later stage of the educational process. This can be achieved because every procedural skill, in the initial stage, is given training to students using a model until students have understood the concept and with a certain level of proficiency (9). The uterus model that is developed should have a structure that is easier to understand but it is necessary to test the function of the uterus model (10).

CONCLUSION

This study concludes that the existing uterus model as a learning media has not been able to provide a true picture. Suggestions to produce the desired product in accordance with the learning objectives are continued to stages of development and disseminate stages.

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