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Burtas Uterus Involution Phantom Development

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ABSTRACT

One way to diagnose retained placenta is by palpating the uterus to confirm uterine involution. Midwives must have these competencies. One effort to improve student competency is the availability of complete facilities and infrastructure. Currently, the phantom used does not describe the process of uterine involution in detail according to post-partum physiology. Detailed and detailed phantoms are very expensive. This research aims to develop a burtas (paper pulp) uterus involution phantom. It is a phantom covering several parts: the pelvis, abdomen, uterus, and external genitalia. The research was done in the laboratory of the Midwifery Department, Poltekkes Kemenkes Palembang, June-October 2023. Research Subjects were DIII Midwifery Study Program students by purposive sampling in small groups of 10 people and large groups of 20 people. This research uses a development research design known as Research and Development (R&D). Research and development aim to develop an existing product that can be tested for feasibility and effectiveness. The stages are potential and problems, data collection, product design, design validation, design revision, product trials, product revisions, usage trials, product revisions, and production. The burtas uterine involution phantom feasibility test results were declared very feasible by media experts with a score of 100%. Material expert with a score of 100%, Students 88.03%. The developed uterine involution phantom can be used as a phantom or alternative teaching aid for examining uterine involution in midwifery and breastfeeding care practicums.

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INTRODUCTION

The incidence of post-partum hemorrhage is estimated at 3-5%. The most common causes of post-partum bleeding are 50-60% due to uterine atony, 16-17% due to placenta retention, 23-24% retained placenta, 4-5% laceration of the birth canal, and 0.5-0.8% due to blood clotting disorders or coagulation factors (Say et al., 2014). Suspicion of a retained placenta can be identified by palpating the uterine fundus to monitor contractions and the height of the uterine fundus. In cases where the uterus fails to involute the uterus, uterine subinvolution will certainly occur (Mastiningsih, 2019).

Uterine subinvolution is a process of delayed uterine return caused by endometrial infection, placental remains, blood clots, or uterine myoma (Wahyuni & Nurlatifah, 2017). Based on Minister of Health Decree Number 320 of 2020 concerning Midwife Professional Standards, the ability to detect early complications during the post-partum period is an independent competency of the midwife profession. Standard operational procedures include examining uterine involution. Management of the educational system in standardized and quality midwifery institutions also significantly produces competent graduates. The practicum learning process in the midwifery clinical laboratory needs to be supported by complete laboratory facilities and infrastructure that can cover all students who practice (Sudarmi, 2016).

The practicum student learning experience in the midwifery laboratory is a learning process that must continue to be improved to hone students' lab skills. The actual practicum setting in the laboratory must provide opportunities for students to practice as often as possible until they can independently carry out lab skills according to the competency targets set (Ulya & Dielsa, 2020). Saputra & Lisiswanti (2015) revealed that the material, delivery methods, participants, instructors, laboratory equipment and management, student activity in participating in practicums, and the quality of laboratory services influence the success of learning in the laboratory.

According to Slameto (2013), facilities and infrastructure influence how students learn because of the facilities and infrastructure used by lecturers when students also use teaching. Complete and appropriate learning tools will facilitate the reception of the material. The props used to check uterine involution are in the form of a phantom. Phantom is a teaching aid in the form of a puppet imitating the human body and organs to support education related to body anatomy (Fadilah et al., 2022).

The uterine involution phantom currently available in laboratories does not fully resemble the size of the uterus of post-partum mothers. For the appropriate uterine involution phantom model, the cost is quite expensive (Amalia et al., 2022). Paper waste is one of the most abundant wastes produced by humans, households, schools, agencies, and offices. As an innovation, paper can be processed into learning media (Siregar et al., 2023).

A preliminary survey at the Midwifery Department of the Poltekkes Kemenkes Palembang revealed no phantom uterine involution. Practical activity for examining uterine involution using a female phantom prop, which is usually used for childbirth care, consisting of the pelvis, abdomen, and external genitalia. The props' weakness is that they cannot be used to palpate the height of the uterine fundus of post-partum mothers. Students can only imagine the feeling of the height of the uterine fundus from week to week.

This research aims to develop a maternal uterine involution phantom whose basic materials are easily accessible and developed by post-partum physiology so that students can practice examining uterine involution in more detail.

METHOD

This research uses a development research design known as Research and Development (R&D) with the ADDIE method. Research and development aims to develop a product that already exists but can be tested for feasibility and effectiveness (Sugiyono, 2015).

The ADDIE method is a framework commonly used by training designers and developers. The ADDIE method is a guideline for training consisting of five phases: Analyze, Design, Develop, Implement, and Evaluate (Junaedi, 2019).

The research was done in the laboratory of the Midwifery Department, Poltekkes Kemenkes Palembang, June-October 2023. Research subjects were DIII Midwifery Study Program students who met the inclusion and exclusion criteria. The inclusion criteria were Semester III students who were willing to be respondents. Exclusion criteria were not present at the time of the study, Did not Study involution uteri yet. The sampling technique is purposive sampling in small groups of 10 people and in large groups of 20 people.

Research data is primary, quantitative, and qualitative data to determine product suitability. Quantitative data was obtained from the assessment of sculpture media experts, material experts (specialist doctors in obstetrics and gynecology, midwife practitioners, and post-partum midwifery and breastfeeding care lecturers), as well as students. Qualitative data was obtained from input and suggestions from experts and respondents. Data collection was carried out using a research instrument in the form of a questionnaire. Data collection techniques using feasibility tests. Data analysis for the assessment results from media experts, material experts, and students used a Likert scale using five categories: very feasible, feasible, quite feasible, not feasible, and very inappropriate.

The feasibility of the Burtas Uterine Involution Phantom is determined by calculating the average value of each aspect. The average value is then matched with the eligibility criteria table according to Sudaryono (2013). Data analysis by calculating the average value of each aspect. Then, the average value is checked with the eligibility criteria table (Sudaryono, 2013).

Table 1. Expert eligibility test criteria

Average Score	Response criteria
0% - 20%	Very inappropriate
21% - 40%	Not feasible
41% - 60%	Quite feasible
61% - 80%	Feasible
81% - 100%	Very feasible

Source: Sudaryono (2013)

Ethical clearance of this research issued by the Health Ethic Committee of Poltekkes Kemenkes Palembang with the ethical clearance number is 0793/KEPK/Adm2/XII/2023.

RESULTS

This research produced teaching aids, namely the Burtas Uterus Involution Phantom, which have been assessed or validated for feasibility by media and material experts. Teaching aids have been tested in the post-partum and breastfeeding midwifery care practicum in the laboratory of the Department of Midwifery

Poltekkes Kemenkes Palembang by lecturers and students.

The steps used in developing phantom involution uteri burtas are as follows:

1. Analyze

At this stage, researchers analyze student needs for phantom involution uteri burtas. Data collection on 30 students semester 3 of Midwifery Department of Poltekkes Kemenkes Palembang, found that 85.2% needed phantom involution uteri burtas.

2. The design planning of burtas uterus involution phantom

The design of the main body of the phantom, namely the pelvic part of the phantom uterine burtas involution, imitates the shape and size of the female pelvic phantom in the laboratory of the Midwifery Department, Poltekkes Kemenkes Palembang.

Figure 1. Common phantoom female pelvis

The novelty of this phantom involution uteri burtas is made of paper and pulp. This distinguishes the uterine burtas involution phantom from the female pelvic phantom on the market, which is generally made of fiber and silicone. Paper is the primary basic material for shaping the female phantom pelvic body.

The expected product specification is the availability of a valid, practical, and effective uterine involution phantom as a solution to the unavailability of uterine involution examination props for post-partum mothers in the Midwifery Department Poltekkes Kemenkes Palembang.

3. Instrument planning

The research instrument used is a questionnaire prepared to evaluate the teaching aids that have been made. This evaluation is carried out by experts who look at the media before testing it in the field. Preparation of instruments based on aspects tailored to the purpose of each questionnaire.

4. Preparation of tools and materials

Tools and materials needed to manufacture a uterine involution phantom are a ruler, pencil, cutter knife, styrofoam block, scissors, waste paper, and paper pulp.

5. Validation

The phantom that has been created is then tested and validated by media experts and material experts. Validation in this research was carried out twice before it was ready to be tested on students to determine student responses to the phantom that had been developed.

After the phantom manufacturing process is complete, the phantom is tested and assessed for validity by media and material experts using questionnaires. The questionnaire provides questions, suggestions, and comments to be filled out by media and material experts as a basis for further phantom improvement.

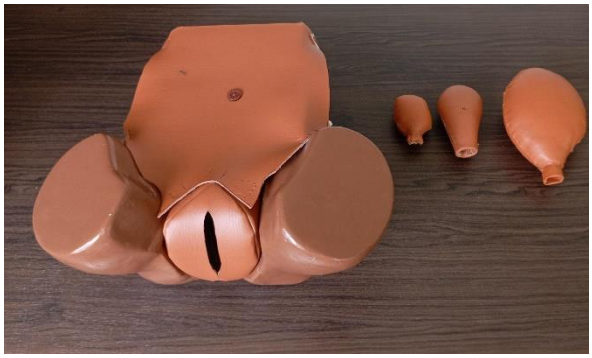

Figure 2. Burtas uterine involution phantoom

The media experts and material experts who assist in the implementation of research on the development of burtas uterus involution phantoom are:

1) Media expert: I Made Gede Putra Jaya, S.Sn, an Educational Laboratory institution at the Indonesian Institute of Arts Denpasar with expertise in fine arts.
2) The first material expert in this study is Kharisma Virgian, SST, M.Keb, a lecturer on post-partum midwifery care and breastfeeding at the Midwifery Department, Poltekkes Kemenkes Palembang.
3) The second material expert of this study is Teti Herawati, STr.Keb is a practitioner midwife at BPM, a practice area for students of the Midwifery Department, Poltekkes Kemenkes Palembang.
4) The third material expert in this study is Dr. Ratih Pratiwi, SpOG (Obstetrics and Gynecology Specialist), a practicing doctor and also a lecturer at the Medical Faculty, University of Muhammadiyah Palembang.

Table 2. The results of first validation questionnaire assessment by media expert

Aspect	Analysis	Validator 1
Media Aspect	∑ score	14
	Max. score	15
	Xi	93.3%
	$\bar{x}$	93%
	Criteria	Very feasible
Visual Communication Aspect	∑ score	10
	Max. score	10
	Xi	100%
	$\bar{x}$	100%

Source: Processed from the results of the first media expert assessment questionnaire

Table 2 shows that the media aspect is very suitable for use, 93%, while the visual communication aspect is 100%.

Table 3 shows that the learning aspect of the criteria is very feasible. Conclusions from material experts, namely from Burtas Phantom, which was developed, can make it easier to determine uterine fundal height. Suggestion: The outer layer of the phantom body is smoothed, and the paint is trimmed. The three material experts said that the phantom needed to be further refined. The visual communication aspect of the criteria is very feasible.

Table 3. The results of first validation questionnaire assessment by material experts

Aspect	Analysis	Validator		
		Validator 1	Validator 2	Validator 3
Learning Aspect	∑ score	29	29	27
	Max. score	35	35	35
	Xi	83%	83%	77%
	$\bar{x}$			81%
	Criteria			Very feasible
Aspects of Visual Communication	∑ score	15	16	18
	Max. score	20	20	20
	Xi	75	90	80
	$\bar{x}$			82%
	Criteria			Very feasible

Source: Processed from the results of the first material expert assessment questionnaire

After experts have reviewed the phantom, revisions are made as the experts recommended. The input researchers receive will be used as reference material to perfect the developed phantom. The parts that need to be revised or improved based on respondents' input are the stomach, the pad under the uterus, the appearance of the phantom to be smoothed, and the thickness of parts of the uterus changed so that there is no supporting pad. Then, the phantom was revised and reassessed by experts in the second validation.

Table 4 shows 100% very feasible in the media aspect, as is the visual communication aspect 100%. According to media experts, it is worth using.

In analyzing existing validity data, researchers apply thematic analysis, namely the process of understanding data (Heriyanto, 2018). The data obtained is grouped based on the existing data type and combined with existing observational data.

Table 4. The results of the second validation questionnaire assessment by media expert

Aspect	Analysis	Validator 1
Media Aspect	∑ Score	15
	Max. Score	15
	Xi	100%
	$\bar{x}$	100%
	Criteria	Very feasible
Visual Communication Aspect	∑ Score	10
	Max. Score	10
	Xi	100%
	$\bar{x}$	100%
	Criteria	Very feasible

Source: Processed from the results of the second media expert assessment questionnaire

Table 5. The results of the second validation questionnaire assessment by material experts

Aspect	Analysis	Validator		
		Validator 1	Validator 2	Validator 3
Learning aspect	∑ Score	35	35	35
	Max. Score	35	35	35
	Xi	100	100	100
	$\bar{x}$			100%
	Criteria			Very feasible
Visual Communi-cation Aspect	∑ Score	20	20	20
	Max. Score	20	20	20
	Xi	100	100	100
	$\bar{x}$			100%
	Criteria			Very feasible

Source: Processed from the results of the second material expert assessment questionnaire

Table 5 shows that the learning aspect received an average score of 100% in the very feasible category and the visual communication aspect. The comments from material experts I and II are suitable for use. Meanwhile, according to evaluation material expert III, the uterus after two weeks needs to be thickened again. The phantom was repaired after the second validation, and the product was tested on students.

Furthermore, the product was tested on students. The results of field trials showed that 97.6% of data was very feasible in the learning aspect, while in the media aspect, data was 100% very feasible. Regarding communication, 93% is very feasible, so the results of trials on students show that phantom is very feasible. This trial is to see how phantom is in the eyes of college students.

At the time of the trial, many comments helped develop this application, including the phantom, which is very interesting and helpful and no different from the silicone phantom.

Evaluation

At the evaluation stage, final improvements to the phantom were made, which were developed based on input from respondents during the implementation stage. Valid criteria with values that are valid enough on the developed media can already be used, and there is no need to revise again, but achieving the perfection of the developed media requires some input for the perfection of the developed tool.

Phantom Involution burtas is expected to be worth using. After the next revision, students carried out another assessment, namely 20 people. The results are as follows: learning aspect 85.6%, media aspect 93.5%, communication aspect 85%.

DISCUSSION

This research produced teaching aids, namely the Burtas Uterus Involution Phantom, which have been assessed or validated for feasibility by media and material experts. Teaching aids have been tested in the post-partum practicum and breastfeeding midwifery care laboratory of the Midwifery Department, Poltekkes Kemenkes Palembang, by lecturers and students.

In the development of Burtas Uterus Involution Phantom, researchers use the ADDIE development model, which consists of 5 stages: Analysis, Design, Development, Implementation, and Evaluation. Based on the problems at the analysis stage, which have been stated in the research results, it is known that students need information. After the analysis stage, the next stage is the design stage. At this stage, the researchers carried out phantom design, instrument design, and preparation of tools and materials.

At the development stage, after the phantom is completed, an evaluation is carried out by experts and educational practitioners, which is called validation. The goal is to get inputs to improve the phantom that was developed. This research is in line with research (Asmi, 2018), which shows that the development stage was evaluated and validated by media and material experts as well as practitioner midwives and obstetrics and gynecology specialists.

The media expert's assessment of this learning media is suitable for use, but some things need improvement. Researchers try to improve according to input from the expert team. After the phantom was revised and declared suitable for testing, it was tested on students. This stage is called the implementation stage.

Based on the data processing results, it is known that from three aspects, namely the learning aspect, the media aspect, and the communication aspect. In the learning aspect, 85.6% of data was very feasible, while 93.5% of data was very feasible in the media aspect. Based on the processed data results in large groups,

which is 85%, it is very feasible. Using a phantom is by the needs of students to determine the height of the fundus uteri and to feel it.

Phantom is an important learning medium. Learning media contributes to quality during the teaching and learning process. Quality learning media has learning components, benefits, and media functions, so media involvement will benefit the learning process. Validation is carried out by media and material experts (Asma et al., 2022). Media and material experts also research and validate phantom making (Lindayani et al., 2020).

The development of Sabvida props has been made according to input from the expert team. Product validity and product feasibility tests have been carried out, as for the overall assessment results, namely agree, which means that the product/tool developed is suitable for use in the learning process (Lestari et al., 2023).

For midwifery students, simulation procedures for assessing obstetric fundal height can be carried out in the clinical skills laboratory or skills lab on simulated patients. Clinical skills laboratories provide a safe and secure environment where students can practice clinical skills before using them in a natural clinical setting. Simulation-based clinical learning can be a valuable tool for better clinical practice. This learning emphasizes a safe and controlled environment with problem-based learning developed and competencies practiced. Simulation-based clinical education is a functional pedagogical approach that allows students to practice their clinical and decision-making skills through various real-life situational experiences without compromising patient well-being (Kim et al., 2016).

A student can use this model repeatedly until he is declared competent by a lecturer or practicum supervisor in the classroom laboratory. When students feel competent in this model, it is only done on actual patients, so this phantom maintains patient safety when students take care of patients directly. Patient safety must be given to patients as a form of quality and best care for these patients (Jones F et al., 2015; Weller et al., 2012; Kim et al., 2016).

CONCLUSION

The developed uterine involution phantom can be used as a phantom or alternative teaching aid for examining uterine involution in midwifery and breastfeeding care practicums.

The burtas uterine involution phantom that has been developed can be used for practicums because it has been validated and declared suitable for use by media experts.

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