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Simple Phantom for Insertion of Intrauterine Contraceptive Device (IUD) Innovation: Learning Methods during The Covid-19 Pandemic

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ABSTRACT

Objective: The purpose of this research is to make and create a simple IUD insertion phantom that can be used by lecturers and students in the Teaching and Learning process, making it easier for students to do the practicum learning process at home.
Method: The method used in this development is the research and development (R&D) method.
Result: The feasibility results of the validation of the phantom display by experts were obtained as much as 93%, the validation of the phantom function was 95%, the field trial resulted in a student response of 89.5% related to the phantom display and 99% of the phantom function.
Conclusion: A simple phantom of Intrauterine Contraceptive Device insertion innovation of learning method during the Covid-19 pandemic is created and can be used.

Keywords: covid-19, learning methods, phantom

Introduction

Corona Virus Disease 2019 (Covid-19) originating from China, to be precise the city of Wuhan has spread very rapidly to various countries including Indonesia. The impact of the outbreak is also felt by the world of education, especially universities, various ways have been carried out by the government to fight Covid-19 including washing hands as often as possible using soap and running water, wearing masks, maintaining physical distancing, social distancing and a ban on crowding. This is a challenge for Higher Education where the learning

process is carried out mostly on campus which requires students and lecturers to interact with each other, crowding and physical contact.

The government issued a ban for universities to conduct face-to-face (conventional) lectures and ordered them to organise online lectures or learning, this was implemented as an effort to prevent the spread of Covid-19 (Kementerian Pendidikan dan Kebudayaan, 2020a). In addition, the government calls for online learning and working from home in order to prevent the spread of Covid-19. (Menteri Pendidikan dan Kebudayaan Republik Indonesia, 2020). In this case, there is a government policy to take action for students to do online learning from home (Maulidina & Bhakti, 2020). The learning period for Education programmes is also stated by the Ministry of Education and Culture (Kementerian Pendidikan dan Kebudayaan, 2020b).

D3 Midwifery as one of the Study Programmes at STIKes Muhammadiyah Ciamis University which implements the online learning process in accordance with applicable regulations, and is supported by Sistem Informasi Dosen (SIDOS), Sistem Informasi Mahasiswa (SIMAK), Zoom, Google Meet, Whatsapp and Quizizz so far have not found any obstacles other than signal strength either from the teaching party or from the learning party. The structure of the Midwifery Education Program contains 40% theory and 60% practice so that the Online learning method is considered less optimal than the practical learning method in several courses including Women's Health and Family Planning where the final ability expected by students is to be able to demonstrate the technique of installing an Intrauterine Contraceptive Device (IUD) which requires students to use a phantom in the practical learning process as a learning media. In the formation of attitudes, skills, ability to cooperate and creativity in receiving knowledge, students must gain learning experience in terms of applying theory as training material and preparation for the application of clinical practice in accordance with the objectives of Practicum Learning (Kementerian Kesehatan RI, 2010).

Everything that can help in the process of delivering information through various channels so that it can stimulate the thoughts, feelings and willingness of students in encouraging the achievement of a good learning process to get new information in accordance with learning objectives (Hamid et al., 2020). Media is a tool used by educators to improve the quality of the learning process with a design that is tailored to the needs. In the learning process, the role of media is very important because it is more varied and not boring (Ramadhana & Hadi, 2021). Media is a tool used by educators to improve the quality of the learning process with a design that is tailored to the needs. In the learning process, the role of media is very important because it is more varied and not boring. In line with the research results (Khotimah, 2021) in Teaching and Learning Activities (KMB) the suitability of the selection in utilising learning media needs to be supported by several factors, namely the selection of the right time and situation. In this case, the situation emphasises the relevance of the health situation which has an impact on the education sector.

Learning media is one of several aspects that support the success of educators in providing teaching to students, in line with Arsyad (Indriyani, 2019) which states that teaching aids that contribute to the climate, conditions, and learning environment, which are arranged and created by the teacher is one of the main functions of learning media. In the teaching and learning process, learning media is very important in helping educators deliver material, especially in practical learning which requires props as a medium for Arsyad (Hutauruk &

Simbolon, 2018). Teaching aids are media learning aids with all kinds of objects used to demonstrate the subject matter. In accordance with the results of research which states that teaching aids are effective in improving students concept understanding (Pangke, Rende, & Komansilan, 2021).

The laboratory is a very important element as an important tool in various scientific activities. In line with the research (Kartikasari, 2019) laboratory utilisation really needs to be utilised optimally as a support for the quality of graduates, theoretical aspects, and aspects of knowledge with skills. The results of the study explained that practicum activities are one of the efforts that can be done to improve students' science process skills and critical thinking skills (Putri, Astalini, & Darmaji, 2022). During the pandemic, one of the efforts to prevent the spread of Covid-19 is that practice is only carried out once in the laboratory offline (off line) with a predetermined time, while practical skills will be proficient if repeated / trained frequently. This will have an impact on the quality of graduates due to the less than optimal practical learning process in the laboratory.

The results of preliminary studies on Level I Semester I students said that 100% of students wanted more frequent practice or phantoms could be borrowed or brought home, the same thing was expressed by level 2 semester 3 students who felt they were not competent in midwifery service practicum because the time was too short when practicum on phantoms in the laboratory was carried out. Poor laboratory management is one of the obstacles to the implementation of practicum activities in addition to the availability of tools, materials in the laboratory and the suitability of the time for implementing practicum activities (Wahyuni & Taiyeb, 2021). The results of other studies explain that the implementation of the practicum has not been fully implemented (Satriani, Taiyeb, & Mu'nisa, 2018).

The condition of the D3 Midwifery Study Program Laboratory already has complete lab equipment including an IUD insertion phantom that is in accordance with the ratio of the number of students, but the phantom cannot be borrowed or taken home on the basis that the number of phantoms is not as many as the number of students and the lab will not be responsible if there is damage.

Objective

The purpose of this research is to make and create a simple IUD insertion phantom that can be used in the Teaching and Learning process by lecturers and students, making it easier for students to carry out the practicum learning process at home.

Method

The method used in this development is the research and development (R&D) method. The research and development method is a method used to produce certain products, and test the effectiveness of these products (Sugiyono, 2019). Research and development itself is conducted based on an industry-based development model, whose findings are used to design products and procedures, which are then systematically field tested, evaluated, and refined to meet certain criteria of effectiveness, quality, and standards (Setyosari, 2020).

Educational research and development (R&D) aims to produce new products through a development process. Research products in the field can be in the form of models, media

equipment, books, evaluation tools and learning tools; curriculum, school policies and others. Each product developed requires different research procedures (Mulyatiningsih, 2019).

From the explanation above, it can be concluded that research and development is a type of research that has the aim of producing certain products, where the product can be the discovery of new products or old products that are developed so that they become new products. In conducting research with Research and Development (R&D) researchers must go through several steps that can be time-consuming.

The Analysis Design Development Implementation Evaluation (ADDIE) research and development model was used to describe a systematic approach to instructional development and fit the researcher's objectives. It was developed by Reiser and Mollenda in 1990. Research related to learning models and learning design is very suitable to use the ADDIE method because it is general and in accordance with development research (Sugiyono, 2019). The analysis stage, design stage, development stage, implementation stage, and evaluation stage are the 5 stages of research and development of the ADDIE model (Sugiyono, 2019).

This research was conducted in the laboratory of the D3 Midwifery Study Programme of STIKes Muhammadiyah Ciamis in the 2020/2021 Academic Year. The subject in this study was a simple phantom for insertion of an intrauterine device (IUD). In this study there were two material experts/experts who were teaching the course Kesehatan Perempuan dan Perencanaan Keluarga and Asuhan Kebidanan Persalinan dan Bayi Baru Lahir, one material expert who is the head of UPTD P5A Dinas P2KBP3A Ciamis Regency who will become validators in obtaining data related to the feasibility of the media which will then be tested on Level III Semester V students of the D3 Midwifery Study Programme totalling 20 students. Based on the data obtained in the research related to the learning media developed, the data obtained from the validation results of material experts, media experts and student responses in the form of quantitative and qualitative data (Sugiyono, 2019).

The data analysis used in this research is qualitative and quantitative data. Qualitative data in the form of suggestions from material and media experts were analysed and described descriptively to review and evaluate the products that had been developed. Quantitative data was analysed after data was collected from all sources. Activities in data analysis are grouping data based on variables and types of sources, tabulating data based on variables from all sources, presenting data for each variable studied, performing calculations to test hypotheses that have been proposed. The Likert scale is used to measure the attitudes, opinions and perceptions of a person or group of people who will be calculated using a rating. The interval scale is used in interpreting the number of scores. The simple phantom product feasibility assessment observation sheet is outlined on the following Likert scale:

Table 1. Expert Validation Score Criteria

Skor	Description
5	Very good
4	Good
3	Good enough
2	Not good
1	Not very good

Source: (Riduwan, 2018)

The validity of the phantom is determined by calculations using the above formula and then interpreted in accordance with table 2.

Table 2. Expert Validation Feasibility Criteria

Achievement Level	Description
81%-100%	Very Feasible / Very Valid / No Revision Required
61%-80%	Feasible / Valid/ Revision As Necessary
41%-60%	Feasible Enough / Valid Enough / Revision Required
21%-40%	Not Feasible/ Less Valid / Revision Required
0%-20%	Extremely Unfeasible / Very Invalid / Revision Required

Source: (Riduwan, 2018)

If the score obtained from experts ≥ 61 and ≥ 81, then the development of a simple phantom of IUD insertion is said to be feasible and very feasible and if the score < 61 is said to be less feasible and needs revision.

Analysis of student questionnaires will be adjusted to the criteria in the following table:

Table 3. Student Response Feasibility Criteria

Achievement Level	Description
81%-100%	Very good
61%-80%	Good
41%-60%	Good enough
21%-40%	Not good
0%-20%	Not very good

Source: (Riduwan, 2018)

Result

After a simple phantom of IUD insertion is made, it is then validated by a validator from a lecturer in the Women's Health and Family Planning course, namely Heni Heryani, SST., M.KM, a lecturer in the Obstetric Care of Childbirth and Newborns (BBL) course, namely Neli Sunarni, SST., M.Keb, and the Head of UPTD P5A of the P2KBP3A Office, Elis Lismayani, SST., M.KM. The validation aims to test the feasibility of Simple Phantom of IUD Insertion with aspects of the feasibility of media display and function in accordance with table 4.

Table 4. Aspects of Assessment Indicators of Feasibility of Simple Phantom Media for IUD Insertion

No	Aspects of Feasibility	Assessment Indicator
1	Display	Media display in the form of colour selection and suitability of phantom shape with female reproductive organs.
2	Function	Vaginal phantom can be done speculum installation, portio mouth is visible during inspection using speculum, on internal examination palpable portio mouth, portio mouth can be clamped, portio can be passed by IUD, IUD can be installed in the uterus, proportional size, the media used is durable and can be used repeatedly. simple phantom learning media for IUD installation does not endanger user safety and is easy to use by lecturers and students..

The feasibility assessment of the appearance and function aspects assessed by three experts in their fields was carried out by filling out an assessment questionnaire. The results of the expert assessment of the appearance and function aspects can be seen in figure 5.

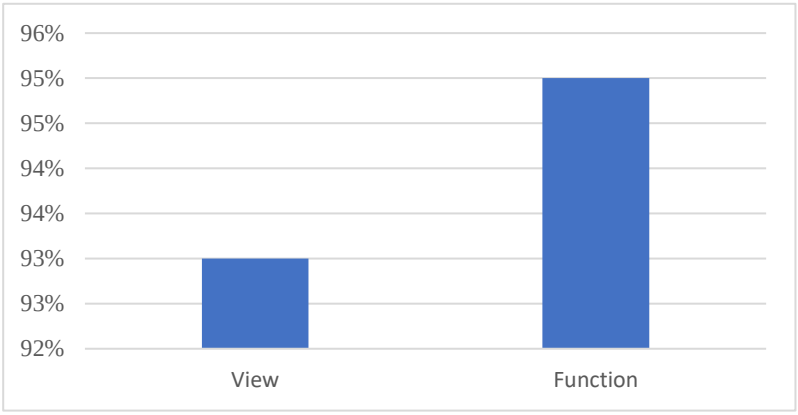

Figure 1. Diagram of Media Feasibility Test Result

Based on figure 5, the results of the media feasibility test include the appearance of colour selection and the suitability of the phantom shape to resemble female reproductive organs getting a score of 93%, and in terms of function 95%. This is in accordance with the results of the study which explain that the phantom developed is classified as very feasible without revision if the score obtained is ≥81% (Riduwan, 2018).

Stage 4 implementation (implementation) Robert Maribe Branch explains that implementation is an activity in the use of products that have been made (Sugiyono, 2019). Implementation of learning media that has been developed in the form of phantoms that are demonstrated in real situations to students. Initial evaluation is carried out after implementation which aims as a benchmark for the application of learning media that has been demonstrated as the basis for implementing the next stage. The implementation stage is carried out on students of D3 Midwifery Study Programme level III semester V by giving a student response questionnaire sheet to determine the feasibility of phantoms as a learning media developed.

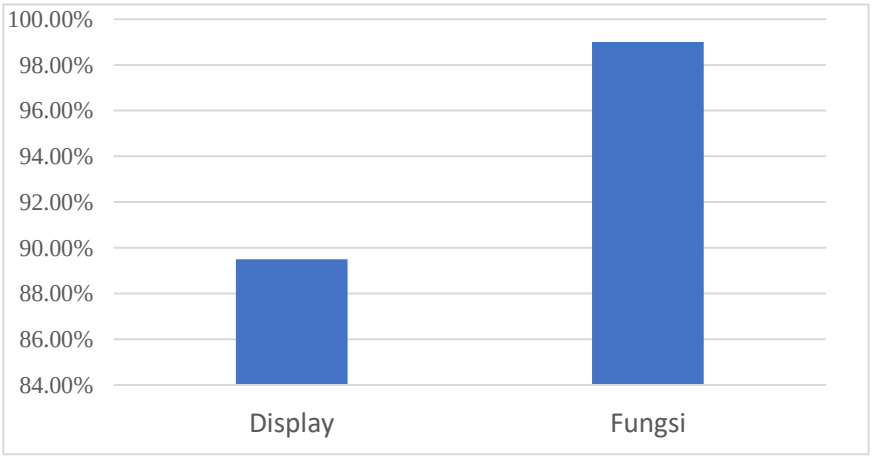

Figure 2. Diagram of Student Response Test Results

Based on diagram 6, it shows that in the questionnaire the response results of the third semester students of the D3 Midwifery Study Program of STIKes Muhammadiyah include the appearance of colour selection and the suitability of the phantom shape resembling female reproductive organs getting a score of 89.5%, and in terms of function 99%. According to students, a simple phantom of IUD installation is easy to use, this is evident when carrying out the IUD installation process, the parts of the simple phantom function according to their usefulness and are not much different from the original phantom.

Stage 5 Evaluation Robert Maribe Branch explains that evaluation is a form of assessment carried out at each stage in making a product whether it is in accordance with the initial planning specifications or not (Sugiyono, 2019). In the stages of needs analysis, design, development, and implementation, evaluation is always carried out. At the needs analysis stage, formative evaluation is carried out by conducting interviews with students to confirm the importance of the availability of phantoms at students' homes when conducting online practicum learning. Evaluation at the design stage is carried out by comparing the materials to be used in making the phantom, trying each form of reproductive organ made so that the phantom can be used in accordance with its function. The feasibility test of the phantom is carried out to evaluate at the development stage. At the implementation stage, the phantom is tested on students who have received theory on Reproductive Health and Family Planning, especially in IUD insertion, to get a response about the appearance and function of the phantom. This stage is done to assess whether the learning method that has been made is in accordance with the planning or not.

Discussion

In essence, education during the Pandemic must remain of high quality, so that to improve the quality of education in addition to the role of teaching staff, the material presented and learning methods, learning media also greatly affects the level of student understanding. In vocational education, learning media is one thing that must be used, because practicum in the laboratory fully uses learning media where an educator will demonstrate various actions using phantoms as learning media. In line with the results of the study which explained that in the course of maternal and neonatal emergencies, learning by using the demonstration method gave better learning outcomes than the audio-visual method (Elmeida & Fitrian, 2018). Noftalina explained the results of her research that in learning maternal neonatal emergency care in breech delivery assistance during the Covid- 19 pandemic there was a significant difference between video tutorials and demonstration methods (Noftalina, 2020).

Demonstration is one of the effective learning methods for midwifery students in supporting their practicum skills. In accordance with the results of the study which explain that the demonstration method can support student learning at the Assyifa Midwifery Academy (Nurfajriah & Erianef, 2018). Other studies explain that there is a significant influence between the understanding of the demonstration method on the implementation of pregnancy examination lab skli (ANC) D III midwifery students STIKes Surya Mitra Husada Kediri (Maharani, Retnaningtyas, & Wardani, 2020). Demonstration method is known to be not only interesting but also one of the learning models that shows the class about a process or how to do something for real (Joyce, Weil, & Calhoun, 2016). A direct teaching method in

which an instrument or teacher shows, demonstrates a process to all students in the class, so that they can see, observe, hear, maybe touch and feel the process being shown is called the demonstration method (Herman, Saddhono, & Waluyo, 2016). In line with the research which states that before and after the intervention both with the method in the form of video and demonstration method proved to increase the knowledge of adolescents (BSE) with no significant difference in the increase in knowledge between the two groups (Aeni & Yuhandini, 2018). The same thing is stated that in the teaching and learning process, the demonstration method is delivered by demonstrating or showing a process, situation or certain objects that are being studied in actual or artificial conditions, accompanied by oral explanations (Mulyadi, 2018). The demonstration learning method used in practical learning is supported by media that is in accordance with the material to be delivered, the media developed in the form of props in the form of a simple phantom of IUD insertion.

The development of a simple phantom in the early stages of the needs analysis was carried out with the results of researchers finding that students were less skilled in doing practicum in the Laboratory where students only got one chance to practice on a phantom related to the Covid-19 health protocol which recommends not crowding and keeping a distance from each other which resulted in the practicum process being carried out in turns and taking a long time. It would be very helpful if students could borrow phantoms to study at home, but with limited phantom ownership and expensive prices, it is not possible for students to lend and take home. Therefore, students become less skilled in IUD insertion.

The researcher's findings obtained at the needs analysis stage through initial observations and interviews with level II students in semester IV of the D3 Midwifery Study Program at STIKes Muhammadiyah Ciamis were used as guidelines in the development of the Intrauterine Contraceptive Device Installation Phantom (IUD). Needs analysis based on analysis of learning methods and learning media used during the Covid-19 pandemic. From the results of the needs analysis, it is necessary to have a phantom that can be used for home practice as a follow-up to the learning process for the Women's Health and Family Planning Course, especially in the material on the installation of Intrauterine Contraceptives (IUD).

This stage is the findings of the analysis relating to what products need to be developed that are adapted to the work situation and environment (Sugiyono, 2019). In the analysis stage the researcher will identify what the participants will learn, therefore the resulting output is in the form of problem identification and task analysis which must be detailed based on needs. So that researchers can determine what products will be developed.

The second stage is design, Robert Maribe Branch explains that designing products according to needs is included in the design stage (Sugiyono, 2019). This activity is carried out systematically, namely designing the shape of the phantom, determining the appropriate colours, tools and materials to be used. The design is adjusted to the needs and constraints experienced by students.

Figure 3. Phantom Insertion of an Intrauterine Device (IUD)
Source: Personal document of D3 Midwifery Study Programme

Figure 3. Describes the IUD insertion phantom in the D3 Midwifery Study Program Laboratory of STIKes Muhammadiyah Ciamis and is in accordance with the standard practical learning model. There are 6 IUD phantoms available in the laboratory, therefore these phantoms are not available for a number of students but are in accordance with the ratio of 1: 10 students.

Before the Covid-19 pandemic existed, the practical learning process did not find any obstacles, students could use the phantom during the course hours or outside the course hours. The existence of students in the dormitory which has a close distance to the Laboratory provides a greater opportunity to borrow phantoms at any time with predetermined requirements whether used in the lab or brought to the dormitory. So that student skills can be trained continuously or repeatedly.

The learning system, mostly carried out online and for practice is only scheduled once with scheduling and implementation adjusted to the rules and Health Protocols during the Covid-19 pandemic. This simple IUD insertion phantom can be produced and owned by students at an affordable price, so it is hoped that when the lecturer is demonstrating on line, students can follow from home.

In making a simple phantom of intrauterine device installation, the following tools and materials are needed: 2 large rectangular jars, 2 small rectangular jars, 2 square boxes, 2 plastic balls, 1 pack of rubber puzzles, 2 short neck bottles, 2 long neck bottles, 2 metres of flannel cloth, 1 kg of dacron, and 1 piece of glue.

The third stage is the development stage (Development). According to Robert Maribe Branch at the development stage, the manufacture of products that have been designed at the design stage is carried out for further testing (Sugiyono, 2019). The development process is carried out in order to apply the product design in accordance with the plan, the product that is ready to be implemented is the realisation of the conceptual framework of the media or method. The process of making products by researchers is adjusted to the design that has been made and starts from small parts of the phantom and is documented.

The development of a simple IUD insertion phantom is made through the following stages: Providing and preparing all tools and materials. First prepare the material to be formed

according to the design by perforating a large rectangular jar at the top and front, cutting the plastic ball into 2 parts, cutting 1/3 of the long and short neck bottle ends, forming the uterus pattern in the puzzle and scissors, making the portio neck layer part of the flannel and dacron, making the vaginal mouth part of the flannel and dacron. Next, make a simple phantom by combining all the materials that have been formed, namely inserting ½ plastic ball into the jar with the split part facing up, sticking the uterus pattern in a small jar and inserting it into the ball, attaching each split end of the long neck bottle and short neck bottle, attaching the portio neck lining from flannel to the small hole at the end of the long neck bottle, store the bottle halves in a jar that has been perforated at the front with the position of the short neck bottle facing in and the long neck bottle facing out, paste the mouth of the part at the front of the jar, align the vaginal opening with the perforated part of the jar, double-check the simple phantom and tidy it up, if it is not sticking enough add glue. Product development is customised according to figure 4.

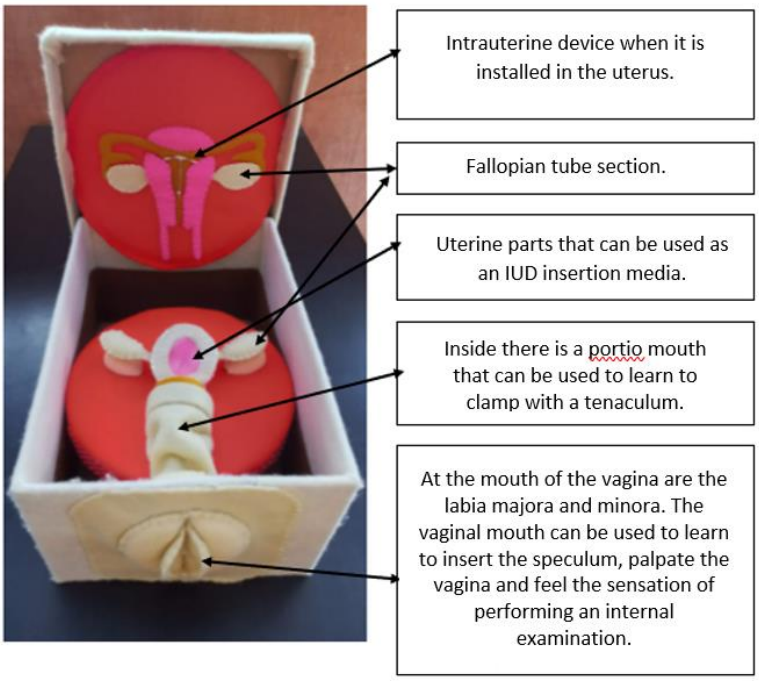

Figure 4. Simple Phantom of Intrauterine Device (IUD) Insertion

Conclusion

The creation of a simple phantom learning model that can be used in the process of Teaching and Learning Activities (KBM) practicum in the Women's Health and Family Planning course by lecturers and students and makes it easier for students to do the practicum independently to install the Intrauterine Contraceptive Device (IUD) at home.

Conflict of interest

There is no conflict of interest.

Authors' contribution

Each author contributed equally in all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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