EFFECTIVENESS OF E-BOOK APPLICATION MODEL UTERINE ATONY MANAGEMENT GUIDE AND POCKETBOOK IN IMPROVING MIDWIFE KNOWLEDGE AND SKILLS IN BASIC CARE: PRE-POST STUDY

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Abstract

Background: Midwives are one of the main health workers at the frontline of health development to accelerate the decline in Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR). Therefore, competent and skilled midwives are needed in carrying out clinical procedures, especially in handling emergency cases of postpartum hemorrhage, with critical analysis skills. This study aims to determine the effectiveness of e-book application model uterine hypotonia management guide and pocket book in improving midwife knowledge and skills in basic care.

Method: The research design used was pre-post study, which was carried out in February-April 2021. The population and sample in this study were all midwives who provided delivery assistance at the Jambi City Health Center, totaling 64 respondents. Data analysis used the Wilcoxon and Mann-Whitney tests.

Results: In each intervention group, all variables, including knowledge and skills, are increased in both groups defined. The results showed that the educational media application of guidelines and pocketbooks on postnatal emergency management increased knowledge and skills.

Conclusion: The two study groups had a significant effect on increasing the knowledge and skills of midwives in handling postnatal emergencies due to uterine atony.

Keywords: Midwive, Emergency handling, learning media, pocket books, applications

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Introduction

The role of health workers will determine the success of development programs in the health sector [1–3]. Midwives are one of the main health workers spearheading health development to accelerate the decline in Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) [4]. For this reason, it is necessary to have midwives who have the ability and skills in clinical procedures, especially in proper management in handling emergency cases of postpartum mothers due to uterine atony with critical analytical skills [5,6].

According to the World Health Organization (WHO), the maternal mortality rate in the world in 2015 was 216 per 100,000 live births, with the highest number in developing countries, namely 239 per 100,000 live births, or 20 times higher than the maternal mortality rate in developed countries, which were only 12 per 100,000 live births [7]. Nearly 75% of all maternal deaths are caused by postpartum hemorrhage, infection (usually after delivery), high blood pressure during pregnancy (pre-eclampsia and eclampsia), and unsafe abortion [8].

Based on the 2012 Indonesian Demographic and Health Survey (IDHS), the maternal mortality rate in Indonesia is 359 per 100,000 live births. It shows a downward trend to 117 per 100,000 live births in 2017, while the Maternal Mortality Rate (MMR) target is according to the Sustainable Development Goals (SDGs) of 70 per 100,000 live births in 2030 [9]. The Maternal Mortality Rate (MMR) in Jambi city in 2018 was 18.86/100 live births, and in 2019 it increased to 46.15/100 live births, although this data is still below the national Maternal Mortality Rate (MMR). Medical factors that are direct causes of maternal death are bleeding by 42%, pregnancy poisoning (eclampsia) 13%, miscarriage (abortion) 11%, infection 10%, delayed labor / prolonged labor 9% and other causes 15% [10].

Obstetric emergencies are life-threatening health conditions that occur during pregnancy or during and after labor and birth [11,12]. The government's effort to reduce Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) is to provide quality basic maternal and neonatal health services,

namely Basic Emergency Obstetrics and Neonatal Services (PONED) at the Puskesmas. However, the maternal and neonatal emergency case services at the PONED Health Center have not been running according to the targeted expectations [13].

The high maternal and infant mortality rate can be caused by the lack of skilled midwives as health service providers, starting from pregnancy to delivery. To improve the knowledge and skills of midwives as service providers, maximum innovation is needed, including the provision of a pocketbook for handling emergency midwifery. This guideline is compiled in the form of a pocketbook equipped with an algorithm to facilitate health workers in handling emergency obstetric cases quickly. The second option can be using an android application that contains an e-book of obstetric emergency case materials, especially in the treatment of uterine atony [14,15].

In Interactive Multimedia, the stimulus appears by presenting exercises related to the material so that the midwife can respond by typing or pressing a button and then facilitated by feedback [16–19]. The existence of an attractive program display can lead to motivation so that aspects of learning readiness will also appear [20–23]. Multimedia applications can assess midwifery/psychomotor skills in basic services to detect emergency cases. Midwives as spearheads for maternal and infant health are good in theory and practice, especially for handling emergency cases. A midwife must provide quality midwifery services to prevent complications and maternal death due to complications [15,24].

The current study aims to evaluate the effectiveness of e-book application model uterine atony management guide and pocket book in improving midwife knowledge and skills in basic care.

Methods

Design

The design used is development, where this method is used to produce certain products and test the effectiveness of these products. Product testing is done by using pre-post Study.

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Participants

The research respondents were 64 midwives (divided into 32 people in group 1 and 32 people in group 2) at PutriAyu Health Center and PakuanBaru Health Center who were randomly selected with the inclusion criteria of midwives who provide delivery services and have a working period of more than one year.

Intervention

The variables of this study are the knowledge and skills of the midwife who will be measured before and after the educational intervention using the application of postpartum emergency guidance due to uterine atony and pocketbooks.

The knowledge questionnaire has objective criteria of good or low, uses a Guttman scale, and consists of 15 questions with a rating range of 0-15. The variable of midwifery skill in this study was defined as the ability of the midwife to practice the procedures for handling emergency obstetrics, in this case uterine atony.

The skill questionnaire has good or poor objective criteria, uses a Guttman scale, and consists of 15 question items with an assessment range of 0-15.

The Guttman scale was used in this study because the variables used were nominal scales. The Guttman scale has an important characteristic, which is that it is a cumulative scale and measures only one dimension of a multi-dimensional variable, so that this scale has an undimensional nature. The data obtained are in the form of interval data or dichotomy ratios (two alternatives) [25].

The group 1 received an intervention providing education on using an emergency postpartum guide application due to uterine atony for seven days. The group 2 will receive an education pocketbook on handling emergency postpartum due to uterine atony for seven days. On the first day before

giving the intervention, researchers measured the level of knowledge using a questionnaire in both study groups, as well as the skills of midwives were measured using a questionnaire consisting of the midwife's ability to prepare tools, prepare patients, perform actions according to procedures, evaluate patient responses to actions that have been taken. midwife, and the ability of the midwife to document the actions that have been taken.

The first stage is the research starting from determining the team, determining the development schedule, selecting and determining the scope, structure, and order of the material, determining multimedia specifications, and making storyboards. The second stage is the development stage consisting of expert validation, practitioner validation, and the implementation and evaluation stages. The third stage is the Effectiveness Test.

Blinding

In this study, 2 enumerators were used to collect research data. The previous enumerators did not know the participants because they were students who had been trained by the researcher before collecting data. The enumerators involved in this study were final year students who were about to complete their midwifery diploma, and were tasked with helping researchers collect data in the field by distributing questionnaires, however, the assessment of participants' skills was assessed by the researcher.

Statistical methods

Data were presented as numbers or percentages for categorical variables. Continuous data are expressed as the mean ± standard deviation (SD), or median with Interquartile Range (IQR). The data obtained were analyzed by univariate and bivariate, from the normality test (Kolmogorov Smirnov) obtained abnormal data so that the analysis used the Wilcoxon and Mann Whitney test.

All tests with p-value (p)<0.05 were considered significant. Statistical analysis was performed using the SPSS version 16.0 application.

Ethical Consideration

Registered prospective respondents have signed an informed consent and there is no incentive to participate in the study and the anonymity of participants is guaranteed. Before carrying out data collection, the researcher first took care of ethical permission.

The authors state that this study followed all ethical clearance processes and was approved by the health research ethics committee of Ministry of Health Polytechnic of Jambi, Indonesia, and registration number: LB.02.06/2/167/2021.

Results

The results of the univariate analysis, which aims to determine the frequency of each variable studied, can be seen in the following table:

Variable	Mean±SD	N	(%)
Age	29.40±5.85		
[21- 32[		42	65.6
[32- 41[		18	28.1
[41- 52[		4	6.3
Job status			
Permanent		44	68.8
Contract		20	31.2
Marital Status			
Married		52	81.2
Unmarried		12	18.8
Working of Period			
≤ 5years		38	59.4
> 5 years		26	40.6

Table 1. *Demographic data of participants*

Table 1 shows that the dominant respondents aged 21-32 year are 41 people (65.6%), have employment status as permanent employees as many as 44 people (68.8%), 52 people are married (81.2%), and have a working period of ≤5 years as many as 38 people (59.4%).

Based on the normality test, the statistical test used in this study is non-parametric, with the results as shown in the following table:

Variable	Group 1		Group 2	
	Mean±SD	Median (Q1-Q3)	Mean±SD	Median (Q1-Q3)
Knowledge				
Pre test	7.2±1.17	10 (6.75-11.25)	6.7±1.30	8 (6.75-10.25)
Post test	9.9±1.98	12 (11.75-14)	8.6±1.26	10.5 (9-12)
P-value	0.001 (W)		0.001 (W)	
Skill				
Pre test	6.9±1.18	8.5 (7-9.25)	6.75±1.29	8.5 (7-9)
Post test	9.7±1.85	12.5 (10-14)	8.8±1.47	11 (10-12)
P-value	0.001 (W)		0.001 (W)	

Description: (W) = Wilcoxon test

Table 2. *Differences in mean values and Wilcoxon test results*

Table 2 shows that in each intervention group, group 1 vs group 2, all variables, both knowledge and skills, have increased. In group 1 (e-book emergency guidance application) the median value of knowledge before intervention was 10 with a mean value of 7.2 while in group 2 (pocket book) it had a median value of 8 with a mean value of 6.7. After the intervention, group 1 (e-book emergency guidance application) had a median value of knowledge of 12 with a mean value of 9.9, while group 2 (pocket book) had a median value of 10.5 with a mean value of 8.6.

On the skill variable, in group 1 (e-book emergency guidance application) the median value before

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intervention was 8.5 with a mean value of 6.9 while in group 2 (pocket book) it had a median value of 8.5 with a mean value of 6.75. After the intervention, group 1 (emergency guide application e-book) had a median skill score of 12.5 with a mean value of 9.7, while group 2 (pocket book) had a median value of 11 with a mean value of 8.8.

The differences in knowledge and skills between the two study groups are presented in table 3.

Variable	P-value
Group 1 vs Group 2 knowledge	0.080 (M)
Group 1 vs Group 2 skill	0.184 (M)

Description: (M) = Maan Whitney test

Table 3. *Result of Mann Whitney test*

Table 3 shows that the results of the Mann Whitney test prove that there is no difference between the two study groups in improving the knowledge and skills of midwives, in the sense that both groups (group 1 and group 2) are equally effective in improving the knowledge and skills of midwives in handling emergency obstetric cases.

Discussion

The information obtained by previous respondents strongly influences a person's level of knowledge. When the pre-test was carried out, the results obtained showed that the midwife had less knowledge before being given an android application for handling postnatal emergencies and a pocketbook. After the intervention, the respondent's knowledge increased by 71% in the group that received Android educational media. In contrast, the group that received pocketbooks in the group 2 also increased even though it was only 57%.

The Mobile Application, Education for handling postnatal emergencies, provides menus of

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information on handling postnatal emergencies, especially animated videos so that participants pay more attention to and master the techniques of handling postnatal emergencies.

Educational media serves to mobilize as many senses as possible to an object to facilitate the perception of the recipient of information [26]. The media will help clarify the information conveyed because it can be more interesting and interactive and overcome the limitations of space, time, and human senses. So that the information conveyed can be clearer and easier to understand according to the purpose for which it will be used [27]. Educational materials can be packaged according to the characteristics of each media used [28]. Today's cellphones not only function as a means of telecommunications but have switched functions to become androids that can do many things [29]. Mobile phones with functions like this can be known as smartphones. Smartphones can assist in medical activities, such as establishing diagnosis and therapy. From various forms of information technology and telecommunications, mobile phones are considered a suitable medium for increasing knowledge in the current developing era. The use of this smartphone is more effective than the module without the application [30,31].

Wahyuni's research [32] on the effect of smartphone applications on a person's knowledge and skills in stimulating the growth and development of toddlers shows an increase in knowledge and skills. Therefore, providing education through interesting media based on Android will make it easier for someone to stimulate independently. In addition to these researchers, other researchers state an effect of using printed media in the form of pocketbooks on increasing the knowledge of postpartum mothers. The study states that print media is the most frequently used and easy-to-reach media, for example, pocketbooks [33]. Pocket books occupy an important position in providing education because they provide clear and practical messages that allow readers to read at any time without the need for the internet to access them and are equipped with images that match the material, making it easier to understand the material [34].

Studies among various healthcare professionals reported mixed results regarding the usefulness of

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the e-learning, mobile learning and technology-enhanced learning. A Cochrane systematic review conducted by Vaona et al in [35] compared traditional learning with e-learning and reported that e-learning may make little or no difference in health professionals' behaviours, skills or knowledge. A study conducted by Subhash et al, [36] among medical students reported that smartphones can be effectively used for learning. A study conducted by Snashall et al, [15] among medical students reported that medical apps can be used as an adjunct in medical education, though the evidence remains limited. Furthermore, data analysis showed that the respondent's skills increased after being given an intervention using an application for handling postnatal emergencies 43%. After being given education through a pocketbook in the group 2, the increase was lower than 21.4%. The results of the Mann-Whitney test in this study showed that there was no difference in knowledge and skills between the two study groups regarding postnatal emergency management who received the android application and the group who received a pocketbook. It shows that any media used can improve knowledge and skills because the function of the media is to help facilitate learning for students, provide a more real experience, attract greater attention from respondents because it is not boring, and all senses of respondents can be activated, attract more attention and interest of respondents in learning [37]. The most plausible reason is that the skill of midwives is higher in the group that received application media education compared to pocketbooks because the application media can be studied anytime and anywhere and displays interesting features and videos of emergency obstetric emergencies, especially uterine atony, so that midwives able to understand and remember strongly the material seen and heard [38].

Conclusion

The application model of pocket books and e-books for the management of uterine atony has been proven to be effective in improving the knowledge and skills of midwives in primary care.

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Study Limitations

The limitation of this study is that this research involves a small number of samples so that this type of research is a preliminary study, and only involves a certain location, namely 1 area, so it cannot compare the results of this study to the character of the community in different locations. In the future it is necessary to conduct research on a large regional scale and the number of samples in a very large size.

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Competing interests statement

There are no competing interests for this study.

Authors' contribution

TH and NU were responsible for the study conception and design; RO performed the data collection; TH and DN performed the data analysis; NU, and RO were responsible for the drafting of the manuscript; TH and NU made critical revisions to the paper for important intellectual content.

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