THE INFLUENCE OF "MATTAMPU" EDUCATIONAL MEDIA APPLICATION OF CHILDBIRTH PREPARATION TO PREGNANT WOMEN'S KNOWLEDGE

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ABSTRACT
Preparation for childbirth is a service through antenatal education to empower prospective parents to increase readiness for childbirth. This study aimed to analyze the effect of educational media application for childbirth preparation, which is used to increase pregnant women's knowledge in facing childbirth. This research was conducted in the Madello Community Health Center, Barru Regency, South Sulawesi, from December 2020 to March 2021. The research method used in this research was quasi-experimental quantitative research with a non-equivalent control group design (two groups, pretest and posttest). The application effectiveness test involved 54 pregnant women divided into two groups, namely the intervention and control groups, with the purposive sampling technique. In the intervention group, the application's effectiveness was measured before and after intervention using the application with an interval of two weeks. The control group was given conventional intervention according to antenatal services obtained from health facilities. Data were analyzed using descriptive analysis and Wilcoxon and Mann-Whitney test statistics. The study showed an increase in knowledge with an average pretest value of 43% increased to 89% after being given the application, the Wilcoxon p-value test of 0.000 <0.05. The authors then conducted a comparative analysis with the Mann-Whitney test. There were significant differences in the intervention and control groups' level of knowledge after being given the application with a p-value in the intervention group <0.05. This study concluded that educational media's application for childbirth preparation effectively increases pregnant women's knowledge about labour preparation.

Keywords: Mattampu application, delivery preparation, pregnancy, knowledge

I. INTRODUCTION
Preparation for childbirth is a significant part of antenatal care carried out through antenatal education in many places worldwide. This is an effort to empower expectant parents to increase their ability and readiness to make the right decisions according to their circumstances (Hatamleh et al., 2019; Barimani et al., 2018).

Currently, the world has entered industry 4.0, which is marked by the occurrence of a digital revolution that can increase the efficiency of product quality through connectivity and digitization. According to the International Data Corporation, in 2019, Android-based smartphone users worldwide amounted to 86.6%. In Indonesia,
internet users were 54.68% of data showing an increase from the previous year to 64.8%. The use of smartphones and the Internet makes access to information easy and concise and easy to access by all society levels because of the fast and varied information acquisition used as an educational medium. Therefore, using a smartphone application is an effective way to educate pregnant women about preparation for childbirth because it is easily accessible anytime and anywhere (Satya, 2019; IDC, 2020; APJII 2019; Lupton, 2016; Brown et al. 2019).

It is highly recommended that antenatal education be given to pregnant women to deal with the mother's ignorance during pregnancy and childbirth. Education on preparation for childbirth has a vital role in the readiness of mothers to face childbirth. Labour readiness can be done by preparing a birth plan and preparing a plan in case of complications in the mother. Prepare a birth plan, namely plans made by pregnant women, husbands or families, and health service workers to prepare physically and psychologically, decide on the choice of place of delivery and assistance, savings plans to prepare for delivery costs, then the family also needs to prepare in case of emergency complications in the mother and Midwives can detect the risk of complications early (Pantiawati & Saryono 2010; Heim et al. 2019; Hassanzadeh et al. 2019; Aziz et al. 2020)

The study on the quality of maternal and infant health services conducted by the Ministry of Health of Indonesia in collaboration with WHO, HOGSI, UNICEF, and UNFPA in 2012 in 10 provinces found that maternal health services were not up to standard. Those are particularly in Antenatal Care services, implementing counselling and education at Community Health Centre (pukesmas) 45% and only 24.2% in hospital. Not achieving standards for counselling and education can lead to a lack of early risk detection for pregnant women and a lack of readiness to face childbirth. Therefore it is necessary to provide education on preparation for childbirth because it is very effective in giving to pregnant women for safe delivery (Kalayil et al. 2016)

Although the Ministry of Health's Strategic Plan's target in 2019 regarding K4 coverage in Indonesia has been achieved, 88.54%, the achievement figure's remainder cannot be considered trivial. It is because, from this number, there could be potential undetected complications. The PWS KIA (Local Regional Monitoring System for Maternal and Child Health) reported about K1 (First-time check-up visit for pregnant women who get service antenatal quality in the first trimester of gestation) and K4 (4th visit of pregnant women to health workers who are competent and receive comprehensive quality antenatal care according to standards) in Barru Regency Health Office in 2019. They reported K1 coverage was 3,248 (91.5%), and K4 coverage was 2,917 (85.29%) in Barru. These data indicated that pregnant women's awareness of antenatal care is good, but there is a decrease in K4. It shows that many pregnant women have not received education about the importance of regular antenatal care in the third trimester. The decreasing K4 coverage district data prove it. In the third trimester, pregnant women are advised to be more diligent in checking their pregnancies. Since that time, the possibility of complications that can harm both the mother and the fetus can be detected early. Important things must also be prepared, such as physical, psychological and emotional, financial in facing the labour process, to the mother's readiness in facing childbirth. It is also essential to discuss with health workers who carry out Antenatal services.

As the spearhead of midwifery care and services, midwives must innovate to deliver education on preparation for delivery. It is equitable, and there is no longer a decrease in K4 coverage. However, the provision of education is still inefficient and indicated by the lack of patient satisfaction with the antenatal services provided with a satisfaction percentage of 67.38% and the majority of patients' dissatisfaction in the aspects of Health Education and pregnancy education of 48.20%. It shows the importance of improving health services so that pregnant women receive education and can cut the chain of being late as an indirect cause of maternal death. The late is including the late in making decisions, receive treatment, going to the referral place due to transportation constraints, and receive treatment due to limited facilities and human resources (Farhati et al., 2018).

The media's presence cannot be separated from people's lives. It is due to the media acts as a communicator in the community by influencing it through messages in information, education, and other messages and can be widely reached by the community. Therefore, pregnant women in this era should have easier access to information about their pregnancy with many information media that have been provided. Also, health workers or midwives are greatly helped by current technological advances because they can provide education about pregnancy with clear and structured sources. So far, providing health education to pregnant women is still conventional. Many midwives deliver education without using supporting media, only not systematic interviews applied. Unsystematic delivery could be one of the causes of low K4 coverage. It has the potential for risky pregnancies and the unpreparedness of the mother in facing childbirth.
II. MATERIALS AND METHODS

Location and Research Design
This research was conducted in the Madello Community Health Center's working area, Barru Regency, South Sulawesi, in December 2020 - March 2021. This study's research method was a quantitative research method with a quasi-experimental research design with a non-equivalent control group design (two-group pretest and posttest).

Population and Sample
The population was all pregnant women who were in the Madello Community Health Center, totalling 63 people. This study's sample consisted of 54 pregnant women with a purposive sampling technique divided into two groups, intervention and control groups. The intervention group was given educational media applications for delivery preparation totalling 27 pregnant women. The control group who was not given special treatment amounted to 27 pregnant women. Inclusion criteria were pregnant women in Madello Community Health Center's working area, can read and write, in the third trimester of pregnancies, have Android, and live in an area covered by the internet network. Meanwhile, the exclusion criteria were pregnant women who could not follow the entire series of studies until it was completed.

Data Collection
The data collection instruments were questionnaire sheets for prospective respondents, consent sheets or informed consent, datasheets for respondent characteristics, and questionnaire sheets for childbirth preparation.

Data Analysis
The Wilcoxon and Mann Whitney tests were used to analyzing the differences in pre and post-knowledge in the intervention and control groups.

Result
A. Univariate Analysis
Univariate analysis was carried out to determine the respondents' characteristics in age, education, and occupation. The data was obtained as presented in the following table (Table 1):

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention Group</th>
<th>Control Group</th>
<th>p -value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20 years</td>
<td>3</td>
<td>4</td>
<td>0,663</td>
</tr>
<tr>
<td>20 – 30 years</td>
<td>24</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma/College</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Senior High School</td>
<td>14</td>
<td>9</td>
<td>0,000</td>
</tr>
<tr>
<td>Junior High School</td>
<td>10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>20</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Civil servants</td>
<td>1</td>
<td>1</td>
<td>0,000</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Honorary</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Based on table 1, it can be seen that the characteristics of the respondents who were given intervention and those who were not. In the Intervention group, the most occupational characteristics of respondents were housewives. About 20 pregnant women (74.1%) were dominated between 20-30 years old and 24 people (88.9%). The average education of pregnant women involved most high school education 14 pregnant women (51.9%), then 10 pregnant women with junior high school education (37%).
In the group that was not given the intervention, respondents' characteristics based on occupation mainly were housewives and 21 pregnant women (77.8%), which were dominated between the ages of 20-30 years as many as 23 pregnant women (85.2%). The average number of pregnant women was pregnant women with junior high school education and 15 pregnant women (55.6%).

A. Bivariate Analysis

Table 2. Effect of educational media applications in the intervention and control groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Knowledge</th>
<th>Average</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lack</td>
<td>Adequate</td>
<td>Good</td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>25 (92%)</td>
<td>1 (4%)</td>
<td>1(4%)</td>
</tr>
<tr>
<td>Posttest</td>
<td>0</td>
<td>2 (7%)</td>
<td>25 (93%)</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>24 (89%)</td>
<td>1 (4%)</td>
<td>2 (7%)</td>
</tr>
<tr>
<td>Posttest</td>
<td>26 (96%)</td>
<td>1 (4%)</td>
<td>0</td>
</tr>
</tbody>
</table>

Based on Table 2, the data were analyzed using the Wilcoxon test because the data were not normally distributed. Table 2 shows that in the intervention group, the average pretest score was 43%. From these data, the knowledge of 27 pregnant women stated in the lack of knowledge category. After being given intervention in the form of an educational media application for childbirth preparation, the knowledge of pregnant women had increased to be good with a value of 89%. The result was a significant p-value of 0.000 < 0.05, which means that there was a significant effect on the respondent's knowledge after being given education in the form of a "Mattampu" application. While in the control group, the pretest average value was 43%, and there was no increase in knowledge. The result was a significant p-value of 0.393 > 0.05, which means no significant effect on the group.

Increased knowledge in the intervention and control groups can be seen in the following figure:

![Increased knowledge of the intervention and control groups](image-url)

Table 3. Differences in the level of knowledge before treatment in the intervention and control groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Level of Knowledge Before Intervention</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean Rank</td>
</tr>
<tr>
<td>Intervention</td>
<td>27</td>
<td>26.98</td>
</tr>
</tbody>
</table>
Control  27  28.02

Mann Whitney Test

Based on table 3, it shows that the p-value 0.630 > 0.05. The mean rank of the level of knowledge in the intervention group was 26.98, smaller than the mean rank in the control group, 28.02. So it can be concluded that there was no significant difference in the level of knowledge in the intervention or control groups before being given the educational media application for childbirth preparation.

Table 4. Differences in the level of knowledge after treatment in the intervention and control groups

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean Rank</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>27</td>
<td>40.96</td>
<td>0.000</td>
</tr>
<tr>
<td>Control</td>
<td>27</td>
<td>14.04</td>
<td></td>
</tr>
</tbody>
</table>

Mann Whitney Test

Based on table 4, it shows that the p-value 0.000 < 0.05. The mean rank of the level of knowledge in the intervention group was 40.96, greater than the mean rank in the control group of 14.04. So it can be concluded that there were significant differences in the level of knowledge in the intervention and control groups after being given the application of educational media for childbirth preparation.

III. DISCUSSION

In table 1, the characteristics of the respondents indicate that there was no relationship between age and the level of knowledge of pregnant women with a value of α > 0.05. While the characteristics of education and work, there was a relationship with pregnant women's knowledge with each value α < 0.05.

In table 2, the researcher conducted a significance test on the acquisition of pretest and posttest values in the intervention and control groups. In the intervention group, the Wilcoxon test results were obtained with a p-value of 0.000 < 0.05. The control group obtained a p-value of 0.393 > 0.05, which means there was no increase in knowledge. So it can be concluded that statistically, the application of educational media for childbirth preparation was significant in increasing the knowledge of pregnant women in the intervention group. It was in line with research that shows significant differences in pregnant women's knowledge before and after the application intervention is given (Lee & Moon, 2016; Ismayanty et al., 2020). Another study also stated that the group given intervention in the form of applications showed a more actual increase in knowledge. In contrast, there was no increase in the control group because they did not get intervention but only conventional education (Tsai et al., 2018).

In the intervention group, pregnant women who experienced a significant increase in knowledge were known through reading labour preparation materials in the second version of the "Mattampu". They used the application for 30 minutes per day for two weeks. It can be seen through the pregnant woman's android smartphone, how long it took the respondent to open the application, and what slide the respondent read educational material. Whereas in the control group, who only received conventional education, there was no increase. From this research, there were several possibilities. At the time of counselling with conventional media, respondents experienced boredom reading the text even though it had been arranged in clear and lay language. Those are related to the nature of print media that does not stimulate all the five senses. Besides, the presentation of information in leaflets only makes it easier for the presenter but ignores the reader's understanding. According to a study, low literacy skills are also an obstacle for respondents to absorb health information (Van Beusekom et al., 2016).

Table 3 shows the difference in mothers' level of knowledge before treatment in the intervention and control groups, which shows a p-value > 0.05. It means that there was no difference in knowledge between the pretest intervention and pretest control groups before the treatment. Conversely, table 4 shows the difference in mothers' level of knowledge after treatment in the intervention and control groups, which shows a p-value < 0.05. It
showed a difference in knowledge between the intervention and control groups after being given educational media preparation for delivery compared to the control group. It can be concluded that the application of educational media for childbirth preparation affects increasing the knowledge of pregnant women about labour preparation. It is in line with research that shows significant differences in pregnant women's knowledge before and after being given the application (Timmers et al., 2018). Other studies also stated that there were differences between the intervention and control groups. The intervention group experienced increased knowledge after being given education on delivery preparation (Sarpkaya et al., 2019; Dewi Nurdianti & Wirakusumah, 2018).

This study is in line with previous research. The increasing use of application media in mobile can increase women's knowledge and understanding of personal health and increase the ability to make the right decisions for their pregnancy (Dolton et al., 2018). Besides, research on health education using smartphones showed that patient knowledge increased 22% after being given the application intervention for a week compared to the control group (Timmers et al., 2018). The same research by Wibowo (2018) shows that providing education through android-based information media can increase pregnant women's knowledge.

This application is expected to be a solution to increase the knowledge of pregnant women about labour preparation. So, pregnant women can prepare for a normal, healthy, and emergency delivery during the delivery process. Research says that the source of information will affect the information received by pregnant women (Yohai et al., 2018).

IV. CONCLUSION AND SUGGESTION
Based on the research results and analysis conducted by researchers on the effect of "Mattampu" educational media application for childbirth preparation. The application of educational media for childbirth preparation effectively increases the knowledge of pregnant women about labour preparation.

Further development research is expected to add content to the dialogue menu between midwives and pregnant women, especially in the third trimester.

REFERENCES
12. International Data Corporation (2020) Smartphone Market Share Contact IDC to purchase Smartphone