



# Effectiveness of Whatsapp-based Digital Education in Improving Knowledge and Early Detection of Preeclampsia in Pregnant Women

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## Abstract

*Preeclampsia is a pregnancy complication characterized by increased blood pressure and proteinuria after 20 weeks of gestation. This condition remains a leading cause of maternal and infant morbidity and mortality worldwide, including in Indonesia. This study aims to evaluate the effectiveness of education in improving pregnant women's knowledge about preeclampsia. The study used a quasi-experimental design with a pretest-posttest control group. This design was used to identify pregnant women by comparing the intervention and control groups before and after education. The study population was pregnant women undergoing prenatal care at the Kustini Turi Lamongan Health Center (TPMB) and meeting the inclusion and exclusion criteria. A sample of 30 respondents was drawn using a purposive sampling technique. The chi-square statistical test showed a p-value of 0.012 ( $p < 0.05$ ), indicating a significant relationship between WhatsApp-based digital education and pregnant women's knowledge about preeclampsia. This suggests that pregnant women exposed to WhatsApp education tended to have better knowledge than those not exposed. Education through WhatsApp in this study contributed to increasing pregnant women's awareness of the importance of routine prenatal checkups and their awareness of pregnancy complications. With increased knowledge, it is hoped that the risk of undetected preeclampsia can be minimized. Pregnant women are expected to be more active in seeking health information and raising awareness of the importance of early preeclampsia detection. For further research, it is recommended to conduct studies with larger sample sizes and use more robust research designs to obtain more comprehensive results.*

**Keywords:** education, knowledge of pregnant women, early detection, preeclampsia

## INTRODUCTION

Preeclampsia is a pregnancy complication characterized by increased blood pressure and proteinuria after 20 weeks of gestation. This condition remains a leading cause of maternal and infant morbidity and mortality worldwide, including in Indonesia. Preeclampsia can progress to more serious conditions such as eclampsia, which can be fatal if not treated promptly and appropriately (Lilik Darwati, 2023). Therefore, early detection and increased knowledge of the signs and symptoms of preeclampsia among pregnant women are crucial. (lilik darwati, Fajrin & Wasiah, 2024).

The WHO estimates that the prevalence of preeclampsia in developing countries is seven times higher than in developed countries. In developed countries, the prevalence rate ranges from 1.3% to 6%, while in developing countries it varies from 1.8% to 18%. In Indonesia, 128,273 cases of preeclampsia are reported annually, equivalent to approximately 5.3% (POGI 2016). Globally, preeclampsia remains a significant issue, with 10% of pregnant women worldwide affected, causing approximately 76,000 maternal deaths and 500,000 infant deaths annually (WHO, 2017).

The incidence of preeclampsia in Indonesia is 128,273 per year, or approximately 5.3-11%, and is the leading cause of maternal mortality. According to the 2020 National Health Working Meeting (Rakerkesnas), the maternal mortality rate in Indonesia remained at 305 per 100,000 live births in 2019 (Kemenkes RI, 2022). This figure remains high considering Indonesia's 2030 Sustainable Development Goals, which aim to reduce maternal mortality to 70 per 100,000 live births (lilik Darwati, 2025).

Low levels of knowledge about preeclampsia among pregnant women remain a common problem. Many pregnant women do not understand the risk factors, danger signs, and the importance of regular prenatal checkups. This can be caused by limited access to information, low levels of education, and suboptimal health education methods provided by health professionals. (Pramesti Paramitha Kristari, 2026)

Along with the development of information technology, health education methods have shifted from conventional to digital. One of the most widely used media today is WhatsApp (Ratna Kusuma & Pangesti, 2022). This application offers advantages in terms of ease of access, relatively low cost, and the ability to convey information in various formats such as text, images, videos, and voice messages. Utilizing WhatsApp as a health education medium is considered to have significant potential to increase the knowledge of pregnant women more effectively and efficiently (Syarifudin, 2020).

WhatsApp-based digital education allows for more flexible interactions between health workers and pregnant women and can be conducted continuously without being limited by time and place (Novyanti et al., 2022). Furthermore, this approach can also increase pregnant women's involvement in understanding

their own health condition, including recognizing the symptoms of preeclampsia early. Objective: This study aims to evaluate the effectiveness of education in increasing pregnant women's knowledge about preeclampsia(Lilik Darwati, 2022).

## METHODOLOGY

This study used a quasi-experimental design with a pretest-posttest with a control group design. This design was used to determine the effectiveness of WhatsApp-based digital education in increasing knowledge about preeclampsia in pregnant women by comparing the intervention group and the control group before and after treatment. The population in this study were pregnant women undergoing prenatal checkups at the Kustini Turi Lamongan TPMB who met the inclusion and exclusion criteria. A sample of 30 respondents was drawn using a purposive sampling technique.

Inclusion criteria: 1) Willingness to participate. 2) Pregnant women between 24 and 38 weeks of gestation. 3) Pregnant women with a mobile phone. 4) Pregnant women with a WhatsApp account. Exclusion criteria: 1) Pregnant women with pregnancy complications. 2) Pregnant women who cannot read. 3) Pregnant women without WhatsApp.

This study aimed to determine the effect of WhatsApp group digital health education on pregnant women's knowledge and attitudes about early detection of preeclampsia. Before conducting the hypothesis test, the researcher conducted a data normality test and obtained non-normally distributed data with a p-value of 0.004. Next, a computerized Wilcoxon test was performed. The significant value of the Wilcoxon test was p-value <0.05, indicating that there was an effect of health education through WhatsApp groups on the knowledge and attitudes of pregnant women regarding early detection of preeclampsia.

## RESULT

**Table 1. Distribution of Characteristics, WhatsApp Education, and Knowledge of Pregnant Women (n = 30)**

Variabel	Kategori	n	%
<b>Age</b>	< 20 years	3	10%
	20-35 years	22	73,3%
	> 35 years	5	16,7%
<b>Education</b>	Elementary School	5	16,7%
	Junior High School	10	33,3%
	High School	12	40%
	University	3	10%
<b>Parity:</b>	Primigravida	12	40%
	Multigravida	18	60%
Edukasi WhatsApp	Exposed	18	60%
	Not Exposed	12	40%
<b>Knowledge</b>	Good Knowledge	14	46,7%
	Sufficient	10	33,3%
	Insufficient	6	20%

Based on Table 1, it is known that the majority of respondents were in the 20–35 age group (22 respondents, 73.3%), while 3 respondents (10%) were under 20 years old, and 5 respondents (16.7%) were over 35 years old. Based on education level, the majority of respondents had a high school education (12 respondents, 40%), followed by 10 junior high school (33.3%), 5 elementary school (16.7%), and 3 college (10%). In terms of parity, the majority of respondents were multigravida (18 respondents, 60%), while 12 respondents were primigravida (40%).

For the WhatsApp education variable, the majority of respondents were exposed to WhatsApp-based digital education (18 respondents, 60%), while 12 respondents (40%) were not exposed. At the knowledge level, the majority of respondents had good knowledge, namely 14 people (46.7%), followed by the sufficient category of 10 people (33.3%), and the less than adequate category of 6 people (20%).

**Table 2 Relationship between WhatsApp Digital Education and the Level of Knowledge of Pregnant Women (n = 30)**

Edukasi WhatsApp	Good	currently	currently	Total	p-value
<b>Exposed</b>	12	4	2	18	
<b>Not exposed</b>	2	6	4	12	
<b>Total</b>	14	10	6	30	<b>0,012</b>

Based on Table 2, it is known that of the 18 respondents exposed to WhatsApp education, the majority (12) had good knowledge, 4 had fair knowledge, and 2 had poor knowledge. Meanwhile, of the 12 respondents not exposed to WhatsApp education, the majority (6) had fair knowledge, 4 had poor knowledge, and only 2 had good knowledge.

The results of the Chi-Square statistical test showed a p-value of 0.012 ( $p < 0.05$ ), indicating a significant relationship between WhatsApp-based digital education and pregnant women's knowledge of preeclampsia. This indicates that pregnant women exposed to WhatsApp education tended to have better knowledge than those not exposed.

## DISCUSSION

Based on the results of a study of 30 respondents, it was found that the majority of pregnant women exposed to WhatsApp-based digital education had a higher level of knowledge than those not exposed. The results of a statistical test using Chi-Square showed a p-value of 0.012 ( $p < 0.05$ ), indicating a significant relationship between WhatsApp-based digital education and pregnant women's knowledge about preeclampsia.

These findings indicate that WhatsApp-based digital education is effective in improving pregnant women's knowledge. WhatsApp, as an easily accessible communication medium, allows for the delivery of health information quickly, flexibly, and repeatedly, making it easier for pregnant women to understand the material. Information presented in the form of text, images, and videos can increase respondents' absorption and comprehension.

Theoretically, increased knowledge is influenced by access to information. The more frequently someone is exposed to information, the greater the likelihood of increased knowledge. In the context of this study, WhatsApp-based education provides easy access to information without time and place constraints, thus supporting the independent learning process of pregnant women.

These results align with health promotion theory, which states that digital media is an effective means of increasing public health knowledge and awareness. Furthermore, previous research (Lilik Darwati et al., 2023) showed that health education via WhatsApp can significantly improve pregnant women's knowledge. Research by (Dwi Haryanti, Desy Widyastutik, 2023) also found that the use of social media in health education had a positive impact on increasing respondents' understanding.

However, in this study, there were still respondents with adequate and inadequate knowledge, despite exposure to digital education. This can be influenced by various factors such as education level, ability to understand information, and individual motivation in receiving education. Furthermore, limited direct interaction between health workers and respondents can also affect the level of understanding achieved (Juwita et al., 2022). Therefore, although WhatsApp-based digital education has proven effective, its use should be combined with other educational methods such as direct counseling or counseling for optimal results. Improving pregnant women's knowledge about preeclampsia is crucial for prevention and early detection. Pregnant women with good knowledge are more likely to recognize the signs and symptoms of preeclampsia, such as high blood pressure, swelling, and severe headaches, and thus seek prompt medical attention.

Education via WhatsApp in this study contributed to raising pregnant women's awareness of the importance of regular prenatal checkups and their awareness of pregnancy complications. With increased knowledge, it is hoped that the risk of undetected preeclampsia can be minimized.

## CONCLUSION

Based on the results of a study on "The Effectiveness of WhatsApp-Based Digital Education in Increasing Knowledge about Preeclampsia in Pregnant Women," with 30 respondents, it can be concluded that the majority of pregnant women were exposed to WhatsApp-based digital education (18 respondents (60%)), and the majority had a good level of knowledge (14 respondents (46.7%)).

The results of the Chi-Square analysis showed a p-value of 0.012 ( $p < 0.05$ ), indicating a significant relationship between WhatsApp-based digital education and pregnant women's knowledge about preeclampsia. This indicates that WhatsApp-based digital education is effective in increasing pregnant women's knowledge about preeclampsia.

In light of these results, it is recommended that healthcare professionals utilize digital media, particularly WhatsApp, as a means of health education for pregnant women. Healthcare institutions are also expected to develop digital-based education programs as an innovation in health promotion that is more effective and easily accessible to the public.

Furthermore, pregnant women are expected to be more active in seeking health information and raising awareness of the importance of early detection of preeclampsia. For further researchers, it is recommended to conduct research with a larger sample size and use a stronger research design to obtain more comprehensive results.

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