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The Influence of Educational Media via WhatsApp Group on Pregnant Women's Ability for Early Detection of Preeclampsia in Pulau Tinggi Village

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ABSTRACT

Preeclampsia remains one of the leading causes of maternal mortality in Indonesia and globally. Early detection is essential to prevent further complications. The use of digital media such as WhatsApp Groups has the potential to serve as an effective educational platform for pregnant women, particularly in rural areas with limited access to health information. **Objective:** To determine the influence of educational media delivered via WhatsApp Group on pregnant women's ability to perform early detection of preeclampsia in Pulau Tinggi Village. **Methods:** This study employed a pre-experimental design with a one-group pretest–posttest approach. The sample consisted of 34 pregnant women who met the inclusion criteria, selected through total sampling. Educational interventions were provided through a WhatsApp Group for four weeks. The ability to detect preeclampsia early was measured using a validated questionnaire administered before and after the intervention. Data were analyzed using a paired t-test. **Results:** There was a significant increase in early detection ability after the educational intervention. The mean pretest score was 55.8 ± 7.9, increasing to 83.4 ± 6.8 in the posttest ($p < 0.001$). Knowledge categories also improved, with the proportion of respondents in the high category rising from 5.9% to 82.4%. Most respondents were aged 20–35 years, had a senior high school education, were multigravida, and were in the second trimester. **Conclusion:** Health education delivered via WhatsApp Group is proven effective in improving pregnant women's ability to perform early detection of preeclampsia. This medium offers an accessible, low-cost, and sustainable alternative for maternal health education in rural communities.

Keywords: Health Education, WhatsApp Group, Preeclampsia, Early Detection, Pregnant Women

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1. Introduction

Maternal mortality remains a major health problem in Indonesia and globally. Its causes consist of direct factors, such as pregnancy and childbirth complications, and indirect factors, such as pre-existing or pregnancy-related diseases (WHO, 2020). Preeclampsia is one of the leading direct causes of maternal death and may progress to eclampsia if not managed promptly and adequately (ACOG, 2020). Preeclampsia is defined as new-onset hypertension after 20 weeks of gestation accompanied by organ dysfunction; therefore, hypertension alone is insufficient for diagnosis (ACOG, 2020).

Previous studies have identified several risk factors for preeclampsia, including maternal age, level of knowledge, gravida status, family history, antenatal care compliance, and history of hypertension (Wulandari et al., 2021). Globally, approximately 10% of pregnant women experience preeclampsia, contributing to 76,000 maternal deaths and 500,000 infant deaths annually (WHO, 2021). In Indonesia, the prevalence is estimated at 5.3% of all pregnancies (Ministry of Health RI, 2019). Local data from Bangkinang General Hospital also indicate an increase in severe preeclampsia cases from 38 cases in 2018 to 45 cases in 2019 (Bangkinang Hospital, 2020).

Early prevention and detection are essential in reducing the incidence and complications of preeclampsia. Health education for pregnant women plays a crucial role in improving knowledge and awareness of danger signs (Lestari & Handayani, 2020). The rising use of smartphones in Indonesia supports digital health education, with WhatsApp emerging as an accessible, widely used, and interactive platform (Kominfo, 2020).

Considering the increasing incidence of preeclampsia and the potential of digital education, this study aims to analyze the influence of WhatsApp Group based education on pregnant women's ability to detect preeclampsia early in Pulau Tinggi Village.

2. Research Method

This study employed a pre-experimental design with a one-group pretest–posttest approach. The research was conducted in Kampar District, specifically in Pulau Tinggi Village, in February 2025. The inclusion criteria consisted of pregnant women residing in Pulau Tinggi Village, entering the second trimester (13 weeks) up to before term (36 weeks), willing to participate as respondents, owning a smartphone with an active WhatsApp application and data plan throughout the study, being able to operate a smartphone and WhatsApp Group, and having prior experience participating in WhatsApp groups and being active in group discussions. The exclusion criteria were severe pregnancy complications. The sampling technique used in this study was total sampling, with a total of 34 participants. The research instrument used was a questionnaire. Design: quasi-experimental one-group pretest–posttest. Duration: approximately 6 weeks (1 week for

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preparation and recruitment, 4 weeks of intervention, and 1 week for post-intervention analysis and follow-up). Independent variable: educational media via WhatsApp Group (intervention). Dependent variable: early detection ability of preeclampsia among pregnant women (questionnaire score). Control variables (recorded): maternal age, parity, education level, gestational age, and history of hypertension.

3. Results and Discussions

a. Result

Table 1 Distribution of Respondent Characteristics

Characteristic	Category	n	%
Maternal Age	< 20 years	2	5.9
	20–35 years	27	79.4
	> 35 years	5	14.7
Education Level	Elementary/Junior High School	10	29.4
	Senior High School	18	52.9
	Higher Education	6	17.7
Parity	Primigravida	14	41.2
	Multigravida	20	58.8
Gestational Age	First Trimester	3	8.8
	Second Trimester	18	52.9
	Third Trimester	13	38.2
History of Hypertension	Yes	6	17.7
	No	28	82.3

The table above shows that the majority of respondents were aged 20–35 years, were multigravida, and were in the second trimester. A small proportion had a history of hypertension (17.7%).

Table 2:

Comparison of Pretest and Posttest Scores (n = 34)

Variable	Mean ± SD	Min–Max	p-value*
Pretest	55.8 ± 7.9	42–72	< 0.001
Posttest	83.4 ± 6.8	68–95	

*Note: paired t-test

Table 2 presents the comparison of early detection ability scores before and after the educational intervention delivered via WhatsApp Group. The results demonstrate a substantial improvement in participants' knowledge following the

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intervention. The mean pretest score was 55.8 ± 7.9, with a score range of 42 to 72, indicating that most participants initially had low to moderate levels of understanding regarding early detection of preeclampsia. After four weeks of educational sessions, the mean posttest score increased markedly to 83.4 ± 6.8, with a range of 68 to 95.

A paired t-test showed that the difference between pretest and posttest scores was highly statistically significant ($p < 0.001$). This indicates that the educational program delivered through the WhatsApp Group effectively enhanced the participants' ability to recognize early signs and risk factors of preeclampsia. The notable increase in mean scores reflects successful knowledge transfer and improved comprehension among pregnant women in the study. Overall, the findings confirm that WhatsApp-based health education can serve as a powerful and accessible tool for improving maternal health knowledge, especially in rural or resource-limited settings.

Table 3.

Category of Early Detection Ability (Pretest–Posttest)

Category	Pretest n (%)	Posttest n (%)
Low (0–59)	21 (61.8%)	1 (2.9%)
Moderate (60–79)	11 (32.4%)	5 (14.7%)
High (80–100)	2 (5.9%)	28 (82.4%)

*T-Test

The distribution of early detection ability categories shows a substantial improvement after the intervention. Before the educational program, most respondents were in the low category (61.8%), but this decreased sharply to only 2.9% after the intervention. Conversely, the proportion of respondents in the high category increased markedly from 5.9% at pretest to 82.4% at posttest. These results indicate that the WhatsApp Group based educational intervention was highly effective in elevating pregnant women's ability to perform early detection of preeclampsia.

b. Discussion

1) Respondent Characteristics

a) Maternal Age

Most respondents were aged 20–35 years (79.4%), the optimal reproductive age with a lower risk of pregnancy complications. Only 5.9% were under 20 years, and 14.7% were over 35 years. This indicates that most participants were at an ideal age to receive and understand health education, including early detection of preeclampsia.

b) Education

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More than half of the respondents had a senior high school education (18 respondents; 52.9%), followed by elementary/junior high school (10 respondents; 29.4%), and higher education (6 respondents; 17.7%). Education level influences a mother's ability to receive and comprehend health information. Because most respondents had a secondary education, using WhatsApp Group as an educational medium is appropriate since the technology is generally familiar across all educational backgrounds.

c) Parity

Parity characteristics showed that 20 respondents (58.8%) were multigravida, while 14 respondents (41.2%) were primigravida. Multigravida mothers typically have previous pregnancy experience that may contribute to prior knowledge of pregnancy complications, though not necessarily specific to preeclampsia. Meanwhile, primigravida mothers require more intensive information because they are experiencing pregnancy for the first time.

d) Gestational Age

The distribution of gestational age indicates that most respondents were in the second trimester (18 respondents; 52.9%), followed by the third trimester (13 respondents; 38.2%) and the first trimester (3 respondents; 8.8%). The second and third trimesters are critical periods for early detection and monitoring of preeclampsia risk; therefore, the respondents' participation at this stage is highly relevant to the objectives of the study.

e) History of Hypertension

Most respondents did not have a history of hypertension (28 respondents; 82.3%), while 6 respondents (17.7%) had a history of hypertension. Although the proportion of mothers with hypertension is relatively small, this group remains important to consider because hypertension is one of the major risk factors for preeclampsia. The presence of respondents with varied health histories provides a more comprehensive picture of the effectiveness of the educational intervention.

2) Effectiveness of WhatsApp Group–Based Education

This study shows that health education delivered through WhatsApp Groups is highly effective in improving pregnant women's ability to perform early detection of preeclampsia. The significant increase in posttest scores ($p < 0.001$) demonstrates that WhatsApp-based educational media containing text, infographics, and short videos can enhance mothers' understanding of preeclampsia warning signs (Sari et al., 2021). These findings are consistent with Sari et al., who

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reported that WhatsApp improves maternal knowledge due to its accessibility, flexibility, and support for self-directed learning (Sari et al., 2021). Similarly, Putri & Rahma found that digital education results in better information retention than brief face-to-face counseling (Putri & Rahma, 2020).

The interactive ature of digital media also increases engagement and strengthens learning through repetition and visualization, as described in Mayer's Cognitive Theory of Multimedia Learning (Mayer, 2020). The combination of text and visuals facilitates better comprehension and memory retention.

3) Shift in Knowledge Categories

The shift from low to high knowledge categories indicates that the 4-week educational intervention was effective. Repeated delivery of materials, visual infographics, and weekly discussions and quizzes strengthened respondents' understanding. This aligns with the Adult Learning Theory, which states that adults learn more effectively when the material is relevant, easy to access, and can be learned independently (Knowles et al., 2015). Learning through WhatsApp satisfies all these criteria.

Yuliana et al. also found that instant messaging platforms improve pregnant women's knowledge of pregnancy complications by providing flexibility and time for gradual comprehension (Yuliana et al., 2022). The significant score improvement was further supported by high participant engagement, as seen in active discussions and quiz participation.

4) Influence of Respondent Characteristics

Most respondents were 20–35 years old, an age group with adequate digital literacy, making it easier for them to engage with digital educational media (Kemenkominfo, 2020). Multigravida women (58.8%) generally have prior pregnancy experience, yet studies show that their knowledge of preeclampsia may still be limited (Siregar et al., 2019), explaining why the intervention was still impactful. Respondents with a history of hypertension (17.7%) may have been more motivated to learn due to their perceived higher risk. WHO notes that high-risk pregnant women are more responsive to education on complications such as preeclampsia (WHO, 2016). Furthermore, most respondents were in their second and third trimesters, which is consistent with ACOG findings indicating these periods as the most effective time for educational interventions due to increased physical awareness (ACOG, 2020).

5) Alignment with Research Procedures

The systematic research process enhanced the validity of the findings. The

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validated questionnaire instrument ensured accurate measurement, while the structured 4-week intervention ensured consistent information exposure. Full participation (100% completion of pretest and posttest) added robustness to the results. According to evaluation theory, consistent, measurable, and structured interventions lead to significant behavioral or knowledge changes (Rossi et al., 2019). This is reflected in the substantial posttest score increase and category shifts.

6) In-Depth Analysis

Overall, the success of the intervention was supported by three key factors:

a) Media suitability — WhatsApp is already widely used by pregnant women, eliminating technological barriers.
b) Adequate intervention duration — Four weeks allowed mothers to absorb material gradually.
c) Relevant and clear content — The use of text, images, and video made learning more effective. These findings reinforce existing literature that digital education is effective and may replace conventional counseling, especially in the modern and post-pandemic era (Johnson et al., 2019).

4. Conclusion

This study demonstrates that education delivered through WhatsApp Groups is effective in improving pregnant women's ability to perform early detection of preeclampsia. There was a significant increase in knowledge scores from pretest to posttest ($p < 0.001$), accompanied by a shift in knowledge categories from predominantly low to predominantly high after the intervention. Respondent characteristics such as being in reproductive age, having good digital literacy, and showing high participation in the group also contributed to the success of the intervention. WhatsApp proved to be an accessible and flexible educational medium that supports gradual comprehension, making it a feasible alternative for maternal health education in the community.

5. Compliance with ethical standards

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Conflict of Interest Declaration

The authors declare no conflict of interest throughout the research process, and all

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contributions were made solely for academic and public health purposes.

Informed Consent Statement

All respondents involved in this study participated voluntarily and provided informed consent prior to data collection. The research procedures, objectives, benefits, and potential risks were explained clearly, and the participants agreed to take part based on mutual understanding and willingness.

REFERENCE

1. American College of Obstetricians and Gynecologists (ACOG). Hypertension in pregnancy: diagnosis and management of preeclampsia and eclampsia. *Obstet Gynecol.* 2020;135(6):e237–60.
2. American College of Obstetricians and Gynecologists. Patient education and counseling in prenatal care. *Obstet Gynecol.* 2020;135(2):e45–52.
3. Johnson DD, Smith A, Brown R. Early detection and management of preeclampsia: a systematic review. *Int J Gynecol Obstet.* 2019;144(1):12–20.
4. Kementerian Kesehatan RI. *Pedoman pendidikan kesehatan untuk tenaga kesehatan dalam pelayanan maternal.* Jakarta: Kemenkes RI; 2018.
5. Kementerian Komunikasi dan Informatika. *Statistik penggunaan smartphone di Indonesia 2020.* Jakarta: Kominfo; 2020.
6. Kementerian Komunikasi dan Informatika Republik Indonesia. *Survei Penggunaan Smartphone di Indonesia 2020.* Jakarta: Kominfo; 2020.
7. Knowles MS, Holton EF, Swanson RA. *The Adult Learner.* 8th ed. New York: Routledge; 2015.
8. Lestari F, Handayani S. Pengaruh pendidikan kesehatan terhadap pengetahuan ibu hamil tentang deteksi dini preeklampsia. *J Kebidanan Indones.* 2020;11(1):45–52.
9. Mayer RE. *Multimedia Learning.* 3rd ed. Cambridge: Cambridge University Press; 2020.
10. Putri A, Rahma L. Perbandingan retensi informasi antara edukasi digital dan penyuluhan langsung singkat pada ibu hamil. *J Kesehat Masy.* 2020;9(1):34–41.
11. Rossi PH, Lipsey MW, Henry GT. *Evaluation: A Systematic Approach.* 7th ed. Thousand Oaks: SAGE Publications; 2019.
12. RSUD Bangkinang. *Laporan tahunan kasus obstetri-ginekologi RSUD Bangkinang tahun 2018–2019.* Kampar: RSUD Bangkinang; 2020.
13. Sari N, Hadiyanti R, Putra A. Efektivitas edukasi kesehatan berbasis WhatsApp terhadap peningkatan deteksi dini preeklamsia pada ibu hamil. *J Kebidanan Indones.* 2021;11(2):78–86.

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14. Siregar R, Dewi P, Kristianto F. Pengetahuan preeklamsia pada ibu multigravida: studi potong lintang. *J Kesehat Reprod.* 2019;10(3):101–8.
15. Wulandari D, Sari N, Putri A. Faktor risiko kejadian preeklampsia pada ibu hamil: studi literatur. *J Kesehat Reproduksi.* 2021;12(2):85–94.
16. World Health Organization. *Maternal mortality: causes and prevention of maternal deaths.* Geneva: WHO; 2019.
17. World Health Organization. *Pre-eclampsia and eclampsia: global burden and strategies for prevention.* Geneva: WHO; 2021.
18. World Health Organization. *WHO recommendations on antenatal care for a positive pregnancy experience.* Geneva: WHO; 2016.
19. Yuliana S, Oktaviani D, Prabowo H. Efektivitas platform pesan instan untuk edukasi maternal. *J Obstet Ginekol.* 2022;14(1):12–19.

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