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Original Research Paper

Enhancing self-care in hypertensive pregnant women through WhatsApp application

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Abstract

Currently, maternal mortality is still largely influenced by the occurrence of pregnancy hypertension. Self-care strategies, delivered via media adjusted to technological progress, accessibility, and pregnant women's needs, offer a practical means to manage this condition. represent a feasible option for the management of this condition. Because of its widespread use, WhatsApp could be used to improve self-care women with pregnancy hypertension. This research aims to determine the effect of WhatsApp on self-care in hypertensive pregnant women. A quasi-experimental pretest-posttest control group design. A total of 42 respondents were recruited by consecutive sampling from six community health centers, 21 respondents were in the intervention group and 21 respondents were in the control group. The outcomes were evaluated using the Hypertension Self-Care Profile (HBP-SCP) questionnaire, which was adapted for the Indonesian context and validated (r=0.517–0.957) and reliable (α=0.935) both before and after health education. Data analysis used nonparametric Wilcoxon matched-pairs and Mann-Whitney tests. In the intervention group, self-care scores improved significantly post-intervention ($p<0.05$), unlike the control group ($p>0.05$). The Mann-Whitney test confirmed a significant difference between groups ($p<0.05$).WhatsApp education boosted self-care scores, utilizing its accessibility and closed-group features for uniform information delivery. These findings advocate integrating such media into community health center protocols, bolstering health professional educational roles. Randomized trials on long-term adherence to WhatsApp-guided self-care protocols and studies comparing these to traditional in-person counseling recommended for future research.

Keywords: health education; pregnancy hypertension; self care; WhatsApp intervention

1. Introduction

Significant causes of maternal death worldwide include pregnancy hypertension, hemorrhage, infection, childbirth complications, and unsafe abortion (WHO, 2024). In Indonesia, the primary cause of maternal mortality in 2022 is hypertension in pregnancy (22.42%), followed by hemorrhage (20.74%), heart disease (6.49%), and infection (4.89%) (Hudaya, 2018; Kemenkes RI, 2022). Management of hypertension in pregnancy includes pharmacological therapy accompanied by non-pharmacological interventions, including all non-drug management efforts, including lifestyle changes. Lifestyle changes can increase the effectiveness of antihypertensive drugs and reduce the dosage and type of antihypertensive drugs (Lv et al., 2024; Wang et al., 2023). Some lifestyle changes that can be made include a healthy diet, physical activity, stress management, avoiding smoking and alcohol, adequate rest, monitoring blood pressure, and paying attention to the signs and symptoms of high blood pressure complications (Charchar et al., 2024; Wang et al., 2023). This aligns with research findings in India, which showed that hypertension during pregnancy is caused by the consumption of added salt in food, fast food, and some studies have shown that high fat and tea intake contribute to hypertension (Sing et al., 2021).

Pharmacological management and lifestyle changes can be integrated with health education on self-care pregnancy hypertension. Therefore, comprehensive efforts are needed through strengthening sustainable health education based on behavior change to increase awareness and the ability of

pregnant women to adopt a healthy lifestyle (Goddard et al., 2025). Self-care-based health education interventions are an important strategy in controlling hypertension in pregnant women, reducing the risk of complications of gestational hypertension, and contributing to a decrease in maternal mortality.

Self-care interventions are an effective approach to improving health and well-being (WHO, 2022). Hypertension, including during pregnancy, can be managed through self-care because pregnant women have special needs in managing their health condition (Junaidi et al., 2024). Self-care is particularly appropriate for pregnant women with hypertension to improve their self-care and health management skills (including increase awareness, knowledge, lifestyle management, medication adherence, stress management, and self-monitoring by recognizing signs and symptoms that are dangerous) to prevent or reduce the occurrence of dangerous impacts of hypertension (Heidari et al., 2025; Mai et al., 2025; Yeh et al., 2022). This approach can be delivered through health education media that align with current technological advances, meet user needs, and remain accessible to hypertensive pregnant women. Thus, technology-based self-care education offers a relevant and convenient strategy for this group.

The role of the media is crucial in influencing the success of an intervention role optimize self-care knowledge and practices hypertensive pregnant women through various of learning formats, including modules, brochures, mobile applications, PowerPoint presentations, social media, booklets, and videos (Rachmawati et al., 2024). Social media provides access to crucial information through smartphones and internet at any time and from any place (Dinari et al., 2022). Among Instagram, TikTok, Telegram, and X, WhatsApp is the top or best popular platform (Fasimi et al., 2020). It uses SMS-like technology but adds interactive and appealing features to make user interaction easier (Zakirman & Rahayu, 2018). WhatsApp, having a vast number of users and an easy-to-use, efficient layout, serves as an effective platform for delivering health education about self-care to hypertensive pregnant mothers. This approach encourages immediate learning and adherence to safety practices.

During pregnancy, mothers rely on social media and mobile apps to access health information and services that facilitate self-care (Moulaei et al., 2021). A 2022 study in Iran by Dinari et al. (2022) with research findings show that the use of social media as a means of supporting self-care for women during the pregnancy to postpartum period places WhatsApp as an effective and valuable information channel in strengthening self-care practices (Dinari et al., 2022). Furthermore, a 2019 study by Parsa et al. (2019) identified the impact of mobile apps on preeclampsia on pregnant women's knowledge, with evidence that mobile-based educational apps improved pregnant women's knowledge about preeclampsia (Parsa et al., 2019). WhatsApp's advantages as a social media platform make it an effective tool for self-care health education for hypertensive pregnant women.

WhatsApp offers promising opportunities to disseminate consistent pregnancy health information, with the main objective of strengthening self-care in this group. The benefits of using this medium for self-care for hypertensive pregnant women include access to accurate, fast, and timely health information from health workers, direct education through WhatsApp facilitates communication and discussion, considering health schedules such as medication intake, antenatal check-ups, doctor visits, and health monitoring regularly to prevent complications due to threatening the mother and fetus. Unfortunately, study on self-care health education for hypertensive pregnant women using WhatsApp is limited. This prompted the author to conduct a study at a health center to determine the effect of WhatsApp on self-care for hypertensive pregnant women.

2. Research Methods

This research uses quantitative approach, a quasi-experiment pre-test and post-test with a control group design. This design has a control group but cannot fully control external variables that affect the results (Sugiyono, 2022). This study was conducted in six Community Health Centers (Puskesmas) in

Sumedang Regency, including Cimalaka, South Sumedang, Paseh, Situraja, Ganeas, Pamulihan, and Tanjungsari, from November to December 2024. The population in this study consisted of all pregnant women diagnosed with hypertension, totaling 42 individuals. The sampling technique used nonprobability sampling with consecutive sampling with inclusion criteria willingly participated by signing informed consent forms and had smartphones with active WhatsApp for the entire 4-week period. Forty-two selected respondents were divided into two groups, an intervention group and a control group, each consisting of 21 people.

Before data collection, the researcher first explained the purpose and objectives of the data collection and provided informed consent, seeking the consent of pregnant women with hypertension to participate in the study. Those who agreed signed the consent form and proceeded to complete the pre-intervention questionnaire; those who declined were excluded. The questionnaire used to measure self-care in pregnant women with hypertension was the Hypertension Self-Care Profile (HBP-SCP) instrument, modified by Pahria et al. into an Indonesian version (Pahria et al., 2022). The researcher then modified it further to address hypertension in pregnancy, and then conducted validity and reliability tests. The validity test results showed an r value of 0.517–0.957 (>0.5), indicating that all questions were valid, while the instrument as a whole demonstrated strong reliability (coefficient = 0.935).

Selected respondents with smartphones equipped with WhatsApp formed the intervention group, receiving tailored health education through this platform. In contrast, the control group underwent standard care, where health workers delivered education using conventional media at the local health center. For the intervention, we organized pregnant women with hypertension into WhatsApp groups based on their specific diagnoses (gestational hypertension, chronic hypertension, or preeclampsia), then provided WhatsApp chats and reminders every four weeks. Content of WhatsApp:

(1) The first week, the first day regarding the meaning, the second day regarding factors and risks, the third day regarding signs and symptoms, the fourth and fifth days regarding controlling and treating hypertension (taking medication given by the doctor regularly according to recommendations, measuring blood pressure, weighing, foods to avoid, the importance of rest, things to avoid during pregnancy), the sixth day regarding physical activity according to pregnancy conditions, and the seventh day regarding signs and dangers of pregnancy.
(2) The second week is a reminder with the arrangement of the first day reminder about the meaning, the second day reminder factors and risks, the third day reminder signs and symptoms, the fourth and fifth days reminder to control and handle hypertension (taking medication given by the doctor regularly according to recommendations, measuring blood pressure, weighing body weight, foods to avoid, the importance of rest, things to avoid during pregnancy), the sixth day reminder physical activity according to pregnancy conditions, and the seventh day reminder signs and dangers of pregnancy.
(3) The third week for the first day asks about the complaint, the second day asks whether there are signs and symptoms of hypertension that worsen, the third, fourth and fifth days ask whether you have taken the medication given by the doctor according to recommendations, have you had your blood pressure measured, have you weighed yourself, how to cook today yourself or buy it, if you cook yourself how much salt is used per day, how is your rest, how is your psychological condition, is it stressful or not, the sixth day asks about the physical activity you do, and the seventh day asks about the condition of fetal movement and whether there are signs of danger in pregnancy.
(4) The fourth week for the first day asks about what the complaint is, the second day asks whether there are signs and symptoms of worsening hypertension, the third, fourth and fifth

days ask whether they have taken the medicine given by the doctor according to the advice, have had their blood pressure measured, have they weighed themselves, how they cooked today themselves or bought it, if they cooked themselves how much salt they used a day, how they rested, how their psychological condition was, whether they

(5) were stressed or not, the sixth day asks about the physical activity they did, and the seventh day asks about the condition of fetal movement and whether there were any signs of danger in the pregnancy.

All research data was analyzed using statistics with SPSS program to use non-parametric tests, namely the Wilcoxon Match Pairs Test used to test the level of significance of the difference between two paired treatments (before being treated and after being treated). The Mann Whitney Test was conducted to test the research hypothesis to determine the effect on the intervention and control groups. The research obtained a certificate of passing ethical testing from the Health Research Ethics Committee of STIKEP PPNI West Java with No. III/082/KEPK-SLE/STIKEP/PPNI/JABAR/X/2024 and has received approval and a research permit from the Sumedang District Health Office with Number: B/540/400.1.2.2/XI/2024.

3. Results and Discussion

3.1.Results

Table 1 presents the characteristics of respondents across both intervention and control groups. Two-thirds of respondents across both groups fell within the 20-35 age range (66.7%), placing them outside high-risk pregnancy categories. Education levels skewed lower, with over half (52.4%) holding only elementary or junior high credentials. Most women in each group were multigravida, having experienced prior pregnancies (76.2%).

Table 1. Respondent Characteristics

Characterstics	Intervention Group		Control Group	
	f	%	f	%
Age				
< 20 years and > 35 years	7	33.3	5	23.8
20-35 years	14	66.7	16	76.2
Education Level				
Elementary School and Junior High School	11	52.4	14	66.7
Senior High School	9	42.9	5	23.8
College	1	4.8	2	9.5
Pregnancy				
Primigravida	5	23.8	1	4.8
Multigravida	16	76.2	20	95.2

Table 2 underscores a clear divergence in self-care categories before and after intervention. Among the intervention group, those with high self-care rose from 11 (52.4%) to the full 21 (100%), wiping out all low scores (previously 10, or 47.6%). The control group saw slight gains, with high self-care climbing from 4 (19%) to 7 (33%) and low scores dipping from 17 (81%) to 14 (67%).

Table 2. Self-Care Categories Before and After Intervention

Category	Intervention Group				Control Group			
	Before		After		Before		After	
	f	(%)	f	(%)	f	(%)	f	(%)
High	11	52.4	21	100	17	81	4	19

Category	Intervention Group				Control Group			
	Before		After		Before		After	
	f	(%)	f	(%)	f	(%)	f	(%)
Low	10	47.6	0	0	4	19	17	81

The Wilcoxon matched-pairs signed-rank test in SPSS was conducted to determine differences in self-care before and after the health education intervention was given to the intervention and control groups **(See Table 3).** The test results in the intervention group showed a difference before and after receiving health education via WhatsApp, as indicated by a p-value <0.05. The control group in the test results showed no significant difference, as indicated by the p-value > 0.05. It can be concluded that health education through WhatsApp media on self-care of pregnant women with hypertension has a difference before and after being given treatment. This means that health education through WhatsApp media has succeeded in helping to improve the self-care in hypertensive pregnant women.

Table 3. Results of the Wilcoxon Rank Test for the Intervention and Control Groups

Group	Rank Category	N	Mean Rank	p-value
Intervention	Negative	1	1.00	
	Positive	20	11.50	0.000
	Ties	-		
Control	Negative	8	6.44	
	Positive	8	10.56	0.393
	Ties	5		

The Mann-Whitney test was used to evaluate the effect of WhatsApp media on hypertensive pregnant women's self-care by comparing the intervention and control groups. The data is presented in Table 4.

Table 4. Result of the Mann-Whitney Test for the Intervention and Control Groups

Group	N	Number of ranks marked	U	P
Intervention	21	657	15.000	0.000
Control	21	246		

The results of the comparative test of self-care of pregnant women with hypertension in the intervention and control groups obtained a decision to reject H0. This can be seen from p <0.05, which means that health education intervention through WhatsApp media is effective in increasing self-care of pregnant women with hypertension. Thus, it can be concluded that health education through WhatsApp media has a significant effect on increasing the total score of self-care in hypertensive pregnant women.

3.2.Discussion

This study showed that the intervention group increased their overall self-care scores the group that received the WhatsApp-based health education intervention showed changes in post-intervention scores, while the control group experienced a tendency for a decrease in scores. These findings indicate the effectiveness of WhatsApp as a health education medium. WhatsApp is a social media application designed to facilitate user communication through various easy-to-use features, particularly text messaging, which allows for the delivery of information in a practical and timely manner (Puspita & Rismayanti, 2024). WhatsApp's various advantages, such as its ease of use without a password, direct integration with phone contacts, efficient data and battery usage, and user-friendly

interface, make it an effective medium for delivering health education (Jacome-Hortua et al., 2024; Manji et al., 2021; Pereira et al., 2020; Utami et al., 2020). These advantages support the success of the intervention in improving self-care among pregnant women with hypertension, both in rural and urban community health centers.

In line with this study's findings, WhatsApp has been widely used in the health sector as an educational tool to improve knowledge and practices in disease prevention and management. Health education via WhatsApp groups has been shown to improve pregnant women at risk of preeclampsia's knowledge (Prihazty et al., 2024). Research in Ghana demonstrated that the use of WhatsApp messaging technology plays a crucial role in strengthening the obstetric referral system for high-risk pregnancies (Owen et al., 2022). Furthermore, various other studies in Indonesia have also reported that health education through WhatsApp groups is effective in improving health knowledge and awareness. A 2024 study demonstrated differences in knowledge levels after providing education through WhatsApp groups, while a 2020 study reported increased maternal knowledge regarding the signs and symptoms of preeclampsia as a result of using WhatsApp-based educational media (Fasimi et al., 2020). Overall, these findings are consistent with the results of this study, which demonstrate that health education through WhatsApp groups is an effective strategy for improving self-care in hypertensive pregnant women.

Although this research shows increased self-care in hypertensive pregnanciesafter receiving WhatsApp health education, several limitations warrant consideration. One major limitation is the researcher's inability to control respondents' exposure to information sources other than the intervention, such as Instagram, TikTok, health websites, and pregnancy apps. During the study, respondents potentially obtained additional information from these various digital platforms, which could have influenced their self-care knowledge and behavior. This limitation is relevant given the current situation of pregnant women, who have extensive digital access and a high propensity to utilize information technology for health education. This situation could serve as a basis for further research to develop more controlled intervention methods, for example, through a combination of WhatsApp-based communication with other techniques such as video calls or scheduled virtual monitoring. This is in line with a Canadian study that demonstrated that managing pregnant women with hypertension through routine daily virtual and face-to-face contact was effective in monitoring maternal and fetal conditions and maintaining control of preeclampsia (Magee et al., 2022).

In addition to these limitations, the health education materials in this study have not been validated by experts competent in the field of pregnancy with hypertension. However, the development of intervention materials was based on a review of relevant and up-to-date literature. One primary reference is a study in Egypt that examined self-care in pregnant women with preeclampsia through a four-week educational module covering the definition of preeclampsia, risk factors, complications, dietary management, the importance of rest, and self-care practices to manage the condition. This module was proven provide a positive impact on strengthening self-care practices pregnancy hypertension (Afefi & Kamel, 2019). Despite these limitations in the material validation process, the results of this study still showed a significant difference in self-care outcomes before and after the WhatsApp-based health education intervention in the intervention group. Targeted content, daily dissemination, and persistent reminders over the four-week period likely drove these gains.

4. Conclusion

Our findings demonstrate that WhatsApp-delivered health education enhances self-care skills among hypertensive pregnant women. This platform proves a practical, accessible tool for boosting knowledge, adherence, and skills in pregnancy-related hypertension management. In short, WhatsApp interventions meaningfully advance self-care in this group. These results call for integrated digital

tools like WhatsApp into community health center protocols, as strengthening the educational role of health professionals. In addition, these results offer a foundation for future nursing research, such as randomized trials evaluating long-term adherence to WhatsApp-guided self-care protocols or comparative studies against traditional in-person counseling.

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