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EFFECTIVENESS OF THE ROLE OF SMS/WHATSAPP REMINDERS, BLOOD PRESSURE SELF-MONITORING, AND PREECLAMPSIA EDUCATION ON THE EARLY DETECTION OF GESTATIONAL HYPERTENSION AT KOSAMBI CLINIC, TANGERANG, IN 2025

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Abstrct

Gestational hypertension and preeclampsia are major contributors to maternal and fetal morbidity and mortality. Early detection through routine blood pressure monitoring is often hindered by low adherence to antenatal care (ANC) visits, limited maternal knowledge, and suboptimal self-monitoring practices. Simple technology-based interventions such as SMS/WhatsApp reminders, home blood pressure self-monitoring, and preeclampsia education may improve early detection of gestational hypertension. Objective to determine the effectiveness of SMS/WhatsApp reminders, blood pressure self-monitoring, and preeclampsia education in improving early detection of gestational hypertension among pregnant women at Kosambi Clinic, Tangerang, in 2025. Methods this study employed a pre-experimental design using a one-group pretest–posttest approach. A total of 30 pregnant women (gestational age 20–37 weeks) meeting the inclusion criteria were recruited. The intervention (approximately 1 month) consisted of structured SMS/WhatsApp reminders, training and recording of blood pressure self-monitoring, and preeclampsia education. Data were collected using observation sheets, questionnaires, and blood pressure measurements before and after the intervention. Normality was assessed using the Shapiro–Wilk test, and pre–post differences were analyzed with a paired sample t-test at a significance level of ≤0.05\le 0.05≤0.05. Results prior to the intervention, 53.6% of participants had blood pressure ≥140/90\ge 140/90≥140/90 mmHg. After the intervention, most participants had normal blood pressure (86.67**%**) and the proportion with hypertension decreased to 13.33%**.** Mean blood pressure decreased from 147.30 to 132.10**,** and the paired sample t-test indicated a statistically significant difference (p ≤0.05\le 0.05≤0.05). Conclusion the combined intervention of SMS/WhatsApp reminders, blood pressure self-monitoring, and preeclampsia education was effective in supporting early detection and improving blood pressure control among pregnant women, potentially reducing the risk of complications related to gestational hypertension.

Keywords: *Gestational Hypertension, Preeclampsia, SMS/Whatsapp Reminder, Blood Pressure Self-Monitoring, Early Detection.*

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INTRODUCTION

Gestational hypertension and preeclampsia are pregnancy complications that significantly contribute to maternal and fetal morbidity and mortality in both developing and developed countries. Elevated blood pressure that arises after 20 weeks of gestation can progress to more severe conditions and lead to various serious complications, including maternal organ dysfunction, restricted fetal growth, preterm birth, and maternal and fetal death. A major challenge in the management of gestational hypertension is its often asymptomatic nature in the early stages, resulting in many cases being detected only at an advanced stage when complications have already occurred.

Antenatal care (ANC) services play an important role in the early detection of gestational hypertension through routine blood pressure monitoring. However, in practice, these efforts have not been fully optimal due to low compliance of pregnant women with ANC visits, limited time and resources in health care facilities, and insufficient maternal knowledge regarding the importance of blood pressure monitoring and the recognition of pregnancy danger signs. These conditions indicate the need for innovative strategies that can strengthen the role of pregnant women in maintaining their health independently and continuously.

The use of simple communication technologies such as SMS and WhatsApp has great potential as reminder and health education media because they are easily accessible, low-cost, and widely used by the community. Structured reminders can improve pregnant women's adherence to blood pressure checks and antenatal visits. In addition, blood pressure self-monitoring enables pregnant women to independently monitor their health status, detect changes in blood pressure at an earlier stage, and increase active involvement in the pregnancy care process. Targeted preeclampsia education also plays an important role in enhancing knowledge, awareness, and the ability of pregnant women to recognize early symptoms of gestational hypertension.

Although each of these interventions has been implemented separately, the application of an integrated approach that combines SMS/WhatsApp reminders, blood pressure self-monitoring, and preeclampsia education remains limited, particularly at the clinic service level. Therefore, this study was conducted to evaluate the effectiveness of this combined intervention on the early detection of gestational hypertension among pregnant women at Kosambi Clinic, Tangerang, as an effort to improve the quality of antenatal care services and prevent pregnancy complications.

METHODS

This study employed a quantitative approach with a pre-experimental design using a one-group pretest–posttest approach. The research was conducted at Kosambi Clinic, Tangerang, in 2025. The study population consisted of all pregnant women who attended antenatal care at the clinic, with a sample of 30 pregnant women selected through total sampling based on the inclusion criteria. The inclusion criteria included pregnant women with a gestational age of 20–37 weeks, the ability to communicate effectively, and active use of WhatsApp.

The intervention was administered for approximately one month and consisted of structured reminders via SMS/WhatsApp regarding antenatal care schedules and blood pressure monitoring, training in blood pressure self-monitoring conducted independently by pregnant women accompanied by recording of measurement results, and preeclampsia education covering the definition, risk factors, signs and symptoms, and the importance of early detection. Blood pressure was measured before and after the intervention using standard measurement instruments. Data were collected through observation sheets, questionnaires, and blood pressure measurement results.

Data analysis began with the Shapiro–Wilk normality test. Subsequently, differences in blood pressure before and after the intervention were analyzed using a paired sample t-test with a significance level of $p \leq 0.05$.

Problem Formulation

Gestational hypertension is often not detected at an early stage due to limited compliance with antenatal care examinations, low levels of knowledge among pregnant women, and suboptimal independent blood pressure monitoring. The use of SMS/WhatsApp

reminders, blood pressure self-monitoring, and preeclampsia education has the potential to serve as an integrated strategy to address these issues. However, the effectiveness of this combined intervention in supporting the early detection of gestational hypertension among pregnant women at the clinic service level has not been clearly established. Therefore, the problem formulation of this study is whether the combination of SMS/WhatsApp reminders, blood pressure self-monitoring, and preeclampsia education is effective in improving the early detection of gestational hypertension among pregnant women at Kosambi Clinic, Tangerang, in 2025.

Literature Riview

a. Gestasional Hypertension

Gestational hypertension is defined as an increase in blood pressure ≥140/90 mmHg that occurs after 20 weeks of gestation in women who were previously normotensive and without proteinuria. This condition carries the risk of progressing to preeclampsia and eclampsia and can lead to serious complications for both the mother and the fetus if not detected early. Gestational hypertension may cause maternal organ dysfunction, hemorrhage, seizures, and an increased risk of maternal mortality. For the fetus, this condition is associated with intrauterine growth restriction, preterm birth, and an increased risk of perinatal mortality.

Early detection through routine blood pressure measurement is the primary effort to prevent complications. However, the implementation of early detection is still hindered by low compliance with antenatal visits, limited maternal knowledge, and inadequate independent blood pressure monitoring.

b. Blood pressure self-monitoring In Pregnant Women

Blood pressure self-monitoring enables pregnant women to measure and record their blood pressure independently and regularly. This approach helps detect increases in blood pressure at an earlier stage, enhances maternal awareness of their health status, and supports the management of gestational hypertension.

c. Preeclampsia Education

Preeclampsia education aims to improve pregnant women's knowledge regarding the definition, risk factors, signs and symptoms, and prevention of gestational hypertension. Improved knowledge is expected to foster more positive health attitudes and behaviors during pregnancy.

d. Integration of Digital Reminders, Self-Monitoring, and Education

SMS/WhatsApp reminders are used to remind pregnant women of antenatal care schedules, blood pressure monitoring, and awareness of pregnancy danger signs. These media are easily accessible, low-cost, and effective in improving maternal compliance.

The combination of SMS/WhatsApp reminders, blood pressure self-monitoring, and preeclampsia education represents an integrated approach with the potential to enhance the early detection of gestational hypertension. This approach encourages active participation by pregnant women and strengthens promotive and preventive efforts in midwifery services.

Research Methodology

a. Type and Research Design

This study employed a quantitative approach with a pre-experimental design using a one-group pretest–posttest approach. This design was used to assess changes in respondents' conditions before and after the intervention without a control group. As explained by Nursalam (2020), this design is appropriate for evaluating the effectiveness of an intervention under limited conditions.

b. Place, Location, and Time of Study

The study was conducted at Kosambi Clinic, Tangerang, Banten Province. Data collection took place from November to December 2025, in accordance with the antenatal care service schedule and the availability of respondents.

c. Population and Sample

The population of this study consisted of all pregnant women who attended antenatal care at Kosambi Clinic, Tangerang. The study sample comprised 30 pregnant women with gestational ages of 20–37 weeks, selected using total sampling based on the inclusion criteria. The determination of sample size referred to the Slovin formula as used by Sugiyono (2021).

d. Research Variables

This study involved two types of variables: independent variables and dependent variables.

1. Independent variable

The independent variable was an integrated intervention consisting of SMS/WhatsApp reminders, blood pressure self-monitoring, and preeclampsia education. SMS/WhatsApp reminders were defined as structured reminder messages sent periodically to remind pregnant women about blood pressure monitoring and antenatal examinations. Blood pressure self-monitoring referred to the independent measurement of blood pressure by pregnant women with routine recording of measurement results. Preeclampsia education involved the provision of health information regarding gestational hypertension and preeclampsia, risk factors, signs and symptoms, and the importance of early detection.

1. Dependent variable

The dependent variable was the ability to identify increases in blood pressure in pregnant women at an early stage before progressing to more severe conditions. This variable was measured through changes in systolic and diastolic blood pressure values before and after the intervention, as well as the classification of pregnant women's blood pressure status based on the criteria for gestational hypertension.

2. Data Collection Instruments

Research instruments are tools used by researchers to collect data in order to facilitate the research process and obtain optimal and comprehensive results (Arikunto, 2010). The instruments used in this study included:

1. bservation sheets to record respondent characteristics and the results of blood pressure measurements before and after the intervention
2. Structured questionnaires to assess the acceptance of SMS/WhatsApp reminders and pregnant women's understanding of preeclampsia
3. Blood pressure self-monitoring logbooks that were completed independently by pregnant women.

The use of questionnaires as primary data collection instruments is consistent with the opinion of Sugiyono (2020), who stated that questionnaires are effective for obtaining data on respondents' behavior and knowledge.

No	Blood Pressure Categories (mmHg)	Number of Pregnant Women	Persentase (%)
1	<90/60 mmHg	3	5,4%
2	90/60 – 140/90 mmHg	23	41,1%
3	> 140/90 mmHg	30	53,6%
	Jumlah	56	100%

Based on the research results shown in the table, it is known that before the implementation of WhatsApp reminders, self-monitoring for early detection, and preeclampsia education, the majority of respondents experienced high blood pressure, with 30 respondents (53.6%). This indicates that the pregnant women were experiencing hypertension.

RESULTS AND DISCUSSION

No	Blood Pressure Categories (mmHg)	Description	Frekuensi (f)	Persentase (%)
1	<90/60 mmHg	Hipotensi	0	0%
2	90/60 – 139/89 mmHg	Normal	26	86,67%
3	> 140/90 mmHg	Hipertensi	4	13,33%
	Jumlah		30	100%

Based on the research results shown in the table, the interpretation after the implementation of WhatsApp-based self-monitoring for early detection of gestational hypertension and preeclampsia education indicates that the majority of pregnant women did not experience hypertension, with 26 respondents (86.67%).

Discussion

The results of this study indicate that the provision of an integrated intervention consisting of SMS/WhatsApp reminders, blood pressure self-monitoring, and preeclampsia education had a positive impact on the early detection of gestational hypertension among pregnant women. This finding is demonstrated by a reduction in the mean systolic and diastolic blood pressure values, as well as an increased proportion of pregnant women with blood pressure within normal limits after the intervention. These results suggest that an approach involving the active participation of pregnant women can enhance the monitoring of health conditions during pregnancy.

The provision of reminders via SMS/WhatsApp played an important role in improving pregnant women's adherence to blood pressure monitoring and antenatal care visits.

Regularly delivered reminder messages helped pregnant women remember examination schedules and increased their awareness of their health status. This is consistent with health behavior theories, which state that reinforcement through external reminders can encourage behavioral change and improve adherence to preventive actions.

In addition, preeclampsia education contributed to improving pregnant women's knowledge and understanding of the risks of gestational hypertension, its signs and symptoms, and the importance of early detection. This increased knowledge influenced more positive health attitudes and behaviors, including compliance with blood pressure monitoring and adherence to health professionals' recommendations. Structured and easily understood educational content enabled pregnant women to be better prepared to recognize pregnancy danger signs.

The combination of these three interventions demonstrated complementary effects. Digital reminders functioned as behavioral reinforcement, self-monitoring enhanced active involvement among pregnant women, and preeclampsia education strengthened cognitive aspects and health awareness. The integration of these approaches was considered effective in supporting promotive and preventive efforts in antenatal care services, particularly in the early detection of gestational hypertension.

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