ORIGINAL RESEARCH

Level of knowledge on preeclampsia following health education through a WhatsApp group

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Article Info	ABSTRACT
	Objective: Hypertension in pregnancy, including preeclampsia, is the third most common cause of maternal mortality in Indonesia. One of the problems is low preeclampsia knowledge in the community. WhatsApp, as a social media platform, could facilitate spearheading promotive and preventive efforts, especially for high-risk mothers in the community. This study aimed to analyze the difference in levels of knowledge after receiving education through WhatsApp groups. **Materials and Methods**: This was a pre-experimental study using one group pre-test and one post-test design. The sample size was 58 high-risk pregnant women in one of the Public Health Centers in Surabaya. Respondents completed a preeclampsia knowledge questionnaire before and after receiving health education via WhatsApp group for 12 days. The results were analyzed using the Wilcoxon signed rank test, Mann-Whitney U-Test, and Kruskal Wallis test. **Results**: Most respondents had good knowledge about preeclampsia before and improved after intervention. All respondents had a difference in knowledge before and after the intervention ($p < 0.001$). The only factor that showed a difference in the initial knowledge level about preeclampsia was previous exposure to preeclampsia information ($p=0.014$). **Conclusion**: Health education through WhatsApp groups can be considered to be provided as it has been proven effective in increasing the knowledge among high-risk pregnant women about preeclampsia.

Highlights:

1. WhatsApp groups can effectively overcome the constraints of antenatal care in delivering health education to pregnant women.
2. The scope of health information about pregnancy should be expanded as this study has shown that it enhances their level of knowledge.

INTRODUCTION

Preeclampsia is the leading cause of maternal morbidity and mortality worldwide. This complication results in more than 70,000 maternal deaths and 500,000 fetal deaths each year globally.[1] In 2021, hypertension in pregnancy including preeclampsia-eclampsia became the third largest contributor to maternal mortality in Indonesia, with as many as 1077 cases.[2] It is expected that 90% of maternal mortalities were classified as preventable deaths.[3] Preeclampsia is the main target of one of the preventable pregnancy complications in Indonesia.[4] Prevention can be done by increasing knowledge about pregnancy danger signs that are found to be related to the ability for better early risk detection in pregnancy.[5] This is especially important for at-risk individuals to have adequate knowledge about pre-eclampsia.[6]

Primary health facilities spearhead promotive and preventive efforts related to health problems. Based on data from the Surabaya City health profile in 2020,[7] the Medokan Ayu Health Center had the lowest coverage of the first antenatal visit compared to other public health centers in Surabaya, which was 49.81%. Likewise, the fourth visit was 79.64%, which was still below the average coverage of antenatal visits in Surabaya.[7] Based on internal data, 14 cases of preeclampsia were recorded in December 2022. The low coverage of antenatal visits is a concern. Mothers who had four or more antenatal visits and visited since the first trimester were likely to have good preeclampsia knowledge.[8] In addition, the method chosen to improve the knowledge needs to be reconsidered. With face-to-face consultations, the health information conveyed was limited due to the short time.[9] Providing health education can be continued online to save time, energy, and costs.[10]

The widespread use of the internet has changed the way people seek health information and communicate with health care providers, including pregnant women who are highly motivated to seek information through online sources.[11] The increased utilization of social media for health education in the community is due to its efficacy in overcoming the limitations of access to information and health support of traditional health services.[12] Increasingly, mothers prefer online media, especially social media groups, to enable interaction and bonding.[13] Therefore, it is necessary to analyze the effect and the effectiveness of the WhatsApp group as a source of information for pregnant women.

MATERIALS AND METHODS

This research was a quantitative study using pre-experimental one group pre-test post-test design. This study was conducted at Medokan Ayu Health Center, Surabaya, Indonesia, in August – September 2023. The population of this study was high-risk pregnant women who attended antenatal visits during that period. There were 58 respondents who participated until completion. This study had received ethical approval from the Health Research Ethics Committee of the Faculty of Medicine, Universitas Airlangga, Surabaya, numbered 118/EC/KEPK/FKUA/2023.

The variables obtained in this study were preeclampsia knowledge besides basic characteristics of the mothers: maternal age, educational background, employment status, gravida status, gestational age, high-risk pregnancy, and previous exposure to preeclampsia information. Health education was conducted by delivering information about preeclampsia through text, posters, and videos six times for 12 days. The knowledge before and after the intervention was evaluated. Knowledge about preeclampsia was measured using a questionnaire with 29 questions that had been tested for validity and reliability. Knowledge scores were classified as good knowledge (76-100), moderate knowledge (56-75), and poor knowledge (<56). The non-parametric test with SPSS version 25 was the Wilcoxon signed rank test to analyze the difference between prior and subsequent knowledge. Mann-Whitney U test and Kruskal Wallis test were conducted to analyze the difference in knowledge based on maternal characteristics.

RESULTS AND DISCUSSION

During the study periods, 174 high-risk pregnant women were attending antenatal care in Medokan Ayu Public Health Center, Surabaya, among them 58 pregnant women who fulfilled the inclusion criteria and were willing to join the study, were recruited. The characteristics of the samples are presented in Table 1.

In this study, most of the respondents aged between 20-35 years old, had the highest education at the secondary education level, were not employed, multigravida, were in their second trimester of pregnancy, and had heard about preeclampsia. The most widely accessed source of health information is social media.

The mean score of knowledge about preeclampsia was found to have increased by 22.625%. More than half of the respondents (56.90%) had good pre-test knowledge and almost all of the respondents (89.67%) had good knowledge after the intervention. The results showed a significant difference in pre-test scores on the variable of previous exposure to preeclampsia information (p=0.014).

Table 1. The profile of the high-risk pregnant women

Characteristics	Participants (58) N (%)
Maternal Age	
< 20	2 (3.4)
20 - 35	47 (81.0)
> 35	9 (15.5)
Education	
Elementary school	5 (8.6)
Junior high school	7 (12.1)
Senior high school	33 (56.9)
Diploma/S1/S2/S3	13 (22.4)
Employment Status	
Unemployed	48 (82.8)
Employed	10 (17.2)
Gravida Status	
Primigravida	16 (27.6)
Multigravida	42 (72.4)
Gestational Age	
1st trimester	6 (10.3)
2nd trimester	31 (53.4)
3rd trimester	21 (36.2)
High-risk pregnancy	
Hypertensive disorder	4 (6.9)
Miscarriage	11 (19.0)
Cesarean section delivery	20 (34.5)
Preeclampsia knowledge before intervention	
Known	31 (53.4)
Did not know yet	27 (46.6)
Sources of health information about pregnancy	
Social media	47 (81.0)
Health workers	19 (32.6)
Parents	10 (17.2)
Family	2 (3.4)
Friends	3 (5.2)
Neighbors	1 (1.7)
Internet search engines	2 (3.4)
Television	1 (1.7)

Table 2. Preeclampsia knowledge score

Knowledge scores	N (%)	Mean ± SD	Minimum-Maximum
Pre-test			
Poor	11 (18.97)		
Moderate	14 (24.14)	72.53 ± 20.17	6.90-96.55
Good	33 (56.90)		
Post-test			
Poor	2 (3.45)		
Moderate	4 (6.90)	88.94 ± 13.01	31.03-100.00
Good	52 (89.67)		

The mean score of knowledge was higher among pregnant women who had received information about preeclampsia. There were no significant differences in knowledge scores according to other variables, either for the pre-test or post-test scores. The finding of better knowledge among those who had received information about preeclampsia indicates that all of the information that had been shared either through social media, consultation with health workers, or from other people, could indeed improve their knowledge. Respondents who had heard about preeclampsia before had better knowledge.[14] Enhanced counseling with health workers is linked to higher levels of knowledge about preeclampsia.[15] The lack of quality and quantity of antenatal consultation is a reason for only 30% of mothers being informed about preeclampsia.[16]

Table 3. Distribution of knowledge level based on characteristics

Characteristics	Pre-test				Post-test			
	Poor	Moderate	Good	p-value	Poor	Moderate	Good	p-value
	N (%)	N (%)	N (%)		N (%)	N (%)	N (%)	
Maternal age								
< 20	0 (0.0)	0 (0.0)	2 (100.0)	0.854[b]	0 (0.0)	0 (0.0)	2 (100.0)	0.172[b]
20 - 35	9 (19.1)	12 (25.5)	26 (55.3)		2 (4.3)	4 (8.5)	41 (87.2)	
> 35	2 (22.2)	2 (22.2)	5 (55.6)		0 (0.0)	0 (0.0)	9 (100.0)	
Education								
Elementary school	1 (20.0)	2 (40.0)	2 (40.0)	0.497[b]	1 (20.0)	0 (0.0)	4 (80.0)	0.348[b]
Junior high school	4 (57.1)	0 (0.0)	3 (42.9)		1 (14.3)	2 (28.6)	4 (57.1)	
Senior high school	6 (18.2)	8 (24.2)	19 (57.6)		0 (0.0)	2 (6.1)	31 (93.9)	
Diploma/S1/S2/S3	0 (0.0)	4 (30.8)	9 (69.2)		0 (0.0)	0 (0.0)	13 (100.0)	
Employment Status								
Unemployed	10 (20.8)	11 (22.9)	27 (56.3)	0.489[a]	2 (4.2)	3 (6.3)	43 (89.6)	0.421[a]
Employed	1 (10.0)	3 (30.0)	6 (60.0)		0 (0.0)	1 (10.0)	9 (90.0)	
Gravida Status								
Primigravida	2 (12.5)	7 (43.8)	7 (43.8)	0.238[a]	0 (0.0)	2 (12.5)	14 (87.5)	0.678[a]
Multigravida	9 (21.4)	7 (16.7)	26 (61.9)		2 (4.8)	2 (4.8)	38 (90.5)	
Gestational Age								
1st trimester	2 (33.3)	1 (16.7)	3 (50.0)	0.437[b]	0 (0.0)	0 (0.0)	6 (100.0)	0.844[b]
2nd trimester	6 (19.4)	8 (25.8)	17 (54.8)		1 (3.2)	4 (12.9)	26 (83.9)	
3rd trimester	3 (14.3)	5 (23.8)	13 (61.9)		1 (4.8)	0 (0.0)	20 (95.2)	
Hypertensive disorder history								
Yes	0 (0.0)	1 (25.0)	3 (75.0)	0.569[a]	0 (0.0)	0 (0.0)	4 (100.0)	0.864[a]
No	11 (20.4)	13 (24.1)	30 (55.6)		2 (3.7)	4 (7.4)	48 (88.9)	
Miscarriage history								
Never	10 (21.3)	13 (27.7)	24 (51.1)	0.372[b]	2 (4.3)	4 (8.5)	41 (87.2)	0.516[b]
Once	1 (12.5)	1 (12.5)	6 (75.0)		0 (0.0)	0 (0.0)	8 (100.0)	
Twice	0 (0.0)	0 (0.0)	2 (100.0)		0 (0.0)	0 (0.0)	2 (100.0)	
Thrice	0 (0.0)	0 (0.0)	1 (100.0)		0 (0.0)	0 (0.0)	1 (100.0)	
Previous cesarean section delivery								
Yes	3 (15.0)	4 (20.0)	13 (65.0)	0.402[a]	1 (5.0)	0 (0.0)	19 (95.0)	0.784[a]
No	8 (21.1)	10 (26.3)	20 (52.6)		1 (2.6)	4 (10.5)	33 (86.8)	
Preeclampsia knowledge before intervention								
Known	1 (3.2)	10 (32.3)	20 (64.5)	0.014[a]	1 (3.2)	1 (3.2)	29 (93.5)	0.050[a]
Did not know yet	10 (37.0)	4 (14.8)	13 (48.1)		1 (3.7)	3 (11.1)	23 (85.2)	

[a]Mann Whitney Test
[b]Kruskal Wallis Test

The finding of better knowledge among those who had received information about preeclampsia indicates that all of the information that had been shared either through social media, consultation with health workers, or from other people, could indeed improve their knowledge. Respondents who had heard about pre-eclampsia before had better knowledge.[14] Enhanced counseling with health workers is linked to higher levels of knowledge about preeclampsia.[15] The lack of quality and quantity of antenatal consultation is a reason for only 30% of mothers being informed about preeclampsia.[16]

According to the maternal age, neither the statistical analysis nor the percentage tendencies showed difference in preeclampsia knowledge. However, based on the educational background, a pattern was seen that the higher the level of education, the more mothers had good knowledge. Mothers who did not receive formal education had lower knowledge about preeclampsia.[8] In addition, the percentage of poor knowledge was found to be higher in non-working women. Working women are more likely to obtain information because they often interact with friends and through mass media.[17] Based on parity, there was no significant difference in knowledge, but the increase in primigravida post-test scores was found to be slightly higher than multi-gravida. This may be because primigravida have a higher need for information due to their changing life period.[18] They tend to seek more specific pregnancy information and more advice regarding their pregnancy compared to multigravida.[19]

Good knowledge was more prevalent in mothers with a history of hypertension in pregnancy and miscarriage, but the difference was not significant due to the small number of respondents who had such a history. Various complications that have been experienced by pregnant women become important experiences for them. Pregnant women who have experienced obstetric complications have better knowledge of preeclampsia and tend to be aware of their condition.[8]

Table 4. Differences in knowledge before and after intervention

Pre-Test	Post-Test			Total
	Poor N (%)	Moderate N (%)	Good N (%)	
Poor	1 (9.1)	3 (27.3)	7 (63.6)	11 (100.0)
Moderate	1 (7.1)	1 (7.1)	12 (85.7)	14 (100.0)
Good	0 (0.0)	0 (0.0)	33 (100.0)	33 (100.0)
Total	2 (3.4)	4 (6.9)	52 (89.7)	58 (100.0)

Wilcoxon sign ranked test (p<0.001)

Most respondents had good preeclampsia knowledge in the pre-test and improved after being given health education through the WhatsApp group. The Wilcoxon Sign Ranked Test results showed a difference between knowledge before and after providing education through the WhatsApp Group.

The increased level of knowledge illustrates the efficacy of using WhatsApp groups to broaden the community's knowledge, specifically pregnant women. This study shows the necessity of special emphasis when providing information about preeclampsia, especially related to symptoms, risk factors, and complications regarding preeclampsia. Many respondents still lacked of knowledge that first pregnancy, too young maternal age, and having a history of high blood pressure in previous pregnancies are risk factors for preeclampsia. A similar result in a previous study, was that only a few respondents had adequate knowledge about risk factors, complications, and symptoms of preeclampsia.[6] This condition needs to be a concern because more women will immediately seek medical care when they recognize the possible consequences of the experienced symptoms.[6] Identifying risk factors is important as prevention and treatment during early pregnancy may support the health of the mother and child in the short and long term.[20]

Symptoms such as epigastric pain were largely unknown to the respondent. This result was also reported in another study, which found serious symptoms including epigastric pain and blurred vision were not recognized by patients.[16] This finding may explain why all of the preeclampsia cases were found to be advanced.[16] Most pregnant women are suffering the main preeclampsia symptoms but they do not realize the actual condition and do not seek health care immediately.[21]

Although almost all items were increased in terms of correct answers after health education, there was one item that showed a decrease in correct answers. This finding indicates that not all respondents received the information points or maybe there was an error in understanding the information. This self-directed learning process cannot be monitored by the provider, which may be vulnerable to different understandings.[10] Therefore, it is important to provide an open forum for discussion.[10]

Most respondents reported utilizing social media as a source of pregnancy-related health information. Through WhatsApp, it is possible to obtain some advice, ask for any doubts, interact with participants, and exchange their experiences, needs, and knowledge.[22] Real-time interactions among participants and health professionals quickly and efficiently can be facilitated through social media.[23] During the provision of the educational materials about preeclampsia, there was active interaction between each respondent and the researcher.

Health education through WhatsApp saves energy, money, and time. It can solve the problem of limited consultation time during antenatal visits to deliver information. Even though it is considered beneficial, due to the flexibility, it is difficult for the provider to control the learning process hence there may be delays in receiving feedback.[10] This study found out four respondents opened the material later. This shows that there was still a potential for ineffectiveness in a few respondents due to the delay in receiving information and limitations in monitoring.

Despite the overall results, this study certainly had limitations. Experimental studies with additional control groups and randomized respondents with a wider study population may show better results. Furthermore, it is necessary to determine the length of the education period concerning memory retention of the information provided. Apart from the limitations, the results clearly showed the effectiveness of WhatsApp as an educational platform for pregnant women with several findings that can be used as suggestions for its implementation and serve as a basis for further development. Considerations for future researchers include comparing or combining various health education media especially those that are suitable for the present era and investigating their effects on health outcomes.

CONCLUSION

Health education through WhatsApp groups can be utilized as a possible solution to the limited consultation time during antenatal care as it has been proven to be effective in increasing the knowledge about preeclampsia among high-risk pregnant women.

DISCLOSURES

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Conflict of interest

There is no conflict of interest to declare.

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Author Contribution

All authors have contributed to all processes in this research, including preparation, data gathering and analysis, drafting, and approval for publication of this manuscript.

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