Original Article

The Impact of Animation Video on Pre-eclampsia Prevention Knowledge and Motivation in Pregnant Women

Dewi Hermawati[1*], Inda Mariana Harahap[2], Aida Fitri[1], Ratna Juwita[1]

ABSTRACT

OBJECTIVE: To assess the impact of animation video on pre-eclampsia prevention knowledge and motivation in pregnant women.

METHODOLOGY: This study used a quasi-experimental method with a non-equivalent control group design within two groups, a pretest and a post-test. The sampling technique was non-probability with purpose sampling method. Sixty-two randomly selected samples were divided into control and intervention groups. The intervention group received an animation video, while the control group received regular information during antenatal care visits. Data collection tools used pre-eclampsia prevention knowledge and motivation questionnaires, which were analyzed using the Mann-Whitney test.

RESULTS: The study showed a difference in the mean value of pretest and post-test knowledge and motivation (p value= 0,000, p value= 0,001), respectively.

CONCLUSION: It can be concluded that applying animation video can increase the knowledge and motivation of pregnant women regarding pre-eclampsia prevention and can be used by healthcare providers to prevent pre-eclampsia for pregnant women.

KEYWORDS: pre-eclampsia, pregnancy, knowledge, motivation, video, media

INTRODUCTION

Pre-eclampsia has the most significant impact on maternal mortality, which complicates nearly a tenth of pregnancies worldwide[1]. According to the American College of Obstetrics and Gynecology (ACOG) in 2020[2], globally, pre-eclampsia occurs in around 2-8% of pregnant women worldwide and is responsible for 10-15% of maternal deaths. The incidence of pre-eclampsia is seven times higher in developing countries (2.8%) compared to the incidence of pre-eclampsia in developed countries (0.4%). In Indonesia, there were 4,627 cases of maternal death in 2020. One of the causes of these deaths was 1,110 cases of hypertension in pregnancy (pre-eclampsia/ eclampsia) experienced by pregnant women. Other causes were caused by bleeding in 1,330 cases and circulatory system disorders in 230 cases[3].

According to the data from the Aceh Health Department (2021)[4], in 2019, Aceh Province had 173 cases of maternal death. The cause of these deaths is related to the condition of pre-eclampsia, which is in second place, namely 16%. In Banda Aceh, the number of pregnant women who experienced pregnancy complications, including pre-eclampsia, was 1,145 pregnant women in 2020.

One of the risk factors for pre-eclampsia includes work, antenatal examination, knowledge and history of hypertension[5]. Knowledge is one of the factors that influences behavior and is the basis for forming a person's behavior. It is hoped that the knowledge that pregnant women have gained will be able to foster motivation in them. Meanwhile, motivation is a person's drive to change behavior to meet their needs[6]. Deaths due to pre-eclampsia can be averted by evidence-based, effective, and timely interventions by increasing women's knowledge and changing attitudes towards preeclampsia[7]. According to ACOG, pregnant women must know how to prevent complications during pregnancy, including pre-eclampsia. Pre-eclampsia prevention includes routine pregnancy checking, monitoring weight gain, regulating activity and rest and regulating nutritional intake during pregnancy[5]. Increasing knowledge and motivation of pregnant women in preventing pre-eclampsia as a step towards reducing Maternal Mortality Rate (MMR) related to pre-eclampsia can be done by educating pregnant women, one of which is through the use of information media[8]. Animated video media is an effective medium because it displays images full of color and moves, making the information provided last longer in the memory and making respondents feel satisfied and happy[9].

The results of initial data collection by researchers at the Aceh Health Department found that the highest number of pregnant women experiencing hypertension in Banda Aceh City in 2022 was at the Banda Raya Community Health Center, numbering 48 out of 255 mothers examined. There were also ten hypertensive mothers out of 322 pregnant women

[1]*Department of Maternity Nursing, Faculty of Nursing, University of Syiah Kuala, Banda Aceh, Indonesia*
[2]*Department of Pediatric Nursing, Faculty of Nursing, University of Syiah Kuala, Banda Aceh, Indonesia*
***Correspondence:** dewihermawati@usk.ac.id*
doi: 10.22442/jlumhs.2024.01128

examined at the Batoh Community Health Center. The hypertension rate is something that must be considered and treated immediately to avoid the incidence of pre-eclampsia in pregnant women. Based on the research background, researchers are interested in researching the impact of animation videos on pre-eclampsia prevention knowledge and motivation in pregnant women. The study aimed to identify the effect of animation videos on pre-eclampsia prevention. The objectives of the study were to identify pregnant women's knowledge and motivation regarding pre-eclampsia prevention between intervention and control groups on pretest and post-test evaluation.

METHODOLOGY

Study Design

The study is quantitative research with the quasi-experimental study method. The design used was a Non-equivalent Control Group with two groups, pretest -posttest. This research was conducted for about 21 days, from February 7 to 27, 2023, by administering questionnaires offline.

Population and Sample

The population was all pregnant women in November 2022-January 2023, namely at the Banda Raya Community Health Center, with as many as 135 pregnant women and at the Batoh Community Health Center, as many as 149 pregnant women, yielding a total population of 284 pregnant women. The sample size was determined based on the Cohen Table for high power in nursing research using a t-test with power (p)=0,80, significant level (α)=0,10 and effect size (d)=0,40 obtained 57 respondents then adding 10% for preventing *drop out* then getting 62 respondents who were divided into 31 respondents for the intervention group and 31 respondents for control groups. Some inclusion criteria in this study were pregnant women in the third trimester of pregnancy, having had at least one pregnancy check-up, having a smartphone and WhatsApp application, being able to read and write, and being willing to be a respondent. At the same time, the exclusion criterion was pregnancy with complications, which can be identified from the pregnancy monitoring book. This research hypothesizes that there is no difference in knowledge and motivation to prevent pre-eclampsia in pregnant women after being given animated videos to pregnant women.

The researcher used a simple random technique to determine the Banda Raya community health center as the research location for the intervention group and the Batoh community health center as the control group, with these two locations located far apart. A total of 31 respondents were taken from each group from the list of Antenatal Care (ANC) visit register. The intervention group received an animation video, while the control group received regular information during antenatal care visits.

In this study, pretest questionnaires were distributed to the control group and intervention group. After both groups stated they were willing to participate in this research, the researcher then sent an animated video related to preventing pre-eclampsia on the same day as the pretest was carried out in the intervention group via the *WhatsApp* application. Meanwhile, the control group did not share the animated video. Researchers accompanied the intervention group to download and ensure the videos could be opened and watched. Six days were allocated for respondents in the intervention group to watch and learn from the video content. On the third and sixth days, the researchers contacted respondents to remind them to continue watching the video given and were allowed to ask if there were things that needed to be discussed with the researcher.

The control group was also given six days to receive education through routine Antenatal Care (ANC) activities at the Community Health Center. The routine ANC check-up was performed by a health professional, namely examination for gestational age and fetus heartbeat, identification of pregnancy complications including pre-eclampsia and education, which is not similar to the content of the animated video provided for the intervention group and varies according to pregnancy condition of respondents. On the seventh day, the researcher contracted time to give post-test questionnaires to the intervention and control groups.

Instrument

Data collection tools used a pre-eclampsia prevention knowledge questionnaire with 20 statements and a pre-eclampsia prevention motivation questionnaire with 12 statements, a newly developed instrument from this study's extensive literature review process. A *Guttman* scale was used for the knowledge questionnaire with true (1) and false (0) options consisting of pre-eclampsia concepts, including definition, signs and symptoms, risk factors, the impact of pre-eclampsia and prevention from pre-eclampsia with the category of knowledge divided into score good (15-20), moderate (11-14), and less knowledge (0-10). A *Likert* scale measures motivation with five answer choices 1 to 5, from strongly disagree to agree strongly. The motivation was divided into scores of strong (32-48), moderate (16-31) and weak (1-5). The validity and reliability of each instrument were performed in a separate health centre. Both instruments are valid and reliable with a Construct validity score greater than 0,444 and a Cronbach Alpha score of knowledge and motivation, namely 0,914 and 0,860, respectively.

Moreover, the animated video media is audiovisual media with exciting writing and moving images with a duration of 9 minutes, which contains material about definitions, signs and symptoms, risk factors, impacts and preventive measures for pre-eclampsia.

Data Analysis

The data analysis method used frequency and

percentage for univariate analysis and the *Mann-Whitney* test to measure the difference in the mean value of knowledge and motivation of pretest and post -test respondents between the intervention and control groups. The Mann-Whitney test was chosen because the distribution of data sets does not meet the normality assumption with the *Kolmogorov-Smirnov* test, which is abnormal.

Ethical Statement

Data collection was carried out after obtaining an ethics pass letter from the Research Ethics Committee of the Faculty of Nursing, Syiah Kuala University, with number 111086011222

RESULTS

This research involved 62 respondents, with the majority of them in reproductive age between 20-35 years old, Multigravida, more respondents in the second trimester of pregnancy; most of them are housewives and never received information regarding pre-eclampsia. More information can be seen in the following **Table I**.

Table I:
Data on Respondent Characteristics (n=62)

Characteristics	Intervention		Control	
	f	(%)	f	(%)
Age				
>35 years old	5	16.1	9	29.0
20-35 years old	26	83.9	22	71.0
Gravida Status				
Primigravida	6	19.4	9	29.0
Multigravida	25	80.6	22	71.0
Gestational Age				
Trimester I	11	35.5	9	29.0
Trimester II	17	54.8	16	51.6
Trimester III	3	9.7	6	19.4
BMI				
Normal	12	38.7	16	51.6
Overweight	18	58.1	9	29.0
Obesity	1	3.2	6	19.4
Hypertension History				
Yes	1	3.2	1	3.2
No	30	96.8	30	96.8
Blood Pressure				
Normal	13	41.9	27	87.1
Pre Hypertension	16	51.6	3	9.7
Hypertension	2	6.5	1	3.2
Occupation				
Government Employees	1	3.2	12	38.7
Self-employed	3	9.7	2	6.5
Housewife	27	87.1	17	54.8
Last Education				
Senior High School	16	51.6	14	45.2
College	15	48.4	17	54.8
Family Income				
≥ Rp 3.000.000	15	48.4	17	54.8
< Rp 3.000.000	16	51.6	14	45.2
Source of Information				
Mass Media	2	6.5	2	6.5
Health Workers	10	32.3	9	29.0
None	19	61.3	20	64.5

Table II: Average Value of Pretest and Post-test Knowledge and Motivation of Pregnant Women regarding Pre-eclampsia Prevention in the Intervention Group and Control Group (n=62)

Variable	Intervention		Control	
	Pretest	*Post-test*	*Pretest*	*Post-test*
Knowledge	16.13	19.19	15.90	17.29
Motivation	42.68	44.74	42.87	43.87

Based on **Table II**, the average value (mean) of knowledge in the pretest and post-test of the intervention group is 16.13 and 19.19, respectively, and the mean value of knowledge in the pretest and post-test of the control group was 15.90 and 17.29 respectively. Then, the mean motivation scores in the pretest and post-test of the intervention group were 42.68 and 44.74, respectively. The mean motivation scores in the pretest and post-test of the control group were 42.87 and 43.87, respectively.

Based on **Table III** above, from the results of statistical test analysis using the Mann-Whitney Test, it can be seen that the pretest for the intervention group and the pretest for the control group, with a mean rank value of 31.68 and 31.32, respectively, obtained a value of p=0.938 with α=0.05. In the post-test, it was found that the mean rank value for the intervention group was 38.08, and the mean rank for the control group was 24.92. It can be seen that the difference in scores in the post-test results of the intervention group and the control group is 13.16 with a value of p=0.003, meaning that animated video effectively increases knowledge of pre-eclampsia prevention for pregnant women.

Based on **Table IV**, the results of statistical test analysis using the Mann-Whitney Test, it can be seen that the pretest for the intervention group and the pretest for the control group, with a mean rank value of 31.60 and 31.40, respectively, obtained a value of p=0.966 with α=0.05. In the post-test, it was found that the mean rank value for the intervention group was 33.24, and the mean rank for the control group was 29.76, with a value of p=0.442 with α=0.05. It can be concluded there is no statistically significant difference between the two groups.

DISCUSSION

Knowledge is a significant domain for the formation of one's actions. It results from human sensing or a person's knowledge of objects through their senses (eyes, nose, ears, and some). The intensity of perception of the object dramatically influences the time from sensing to producing knowledge. Moreover, motivation is a series of attitudes and values that influence individuals to achieve specific things according to individual goals. These attitudes and values are invisible, which provide the strength to encourage individuals to achieve their goals. Motivation can be interpreted as an individual's encouragement to take action because they want to

Table III: Distribution of Differences in Pregnant Women's Knowledge about Pre-eclampsia Prevention between the Intervention Group and Control Group at Pretest and Post-test (n=62)

Variable	Result	Intervention		Control		Mann Whitney U	α	P-Value
		Mean Rank	Sum of Rank	Mean Rank	Sum of Rank			
Knowledge	Pretest	31.68	982.00	31.32	971.00	475.000	0.05	0.938
	Posttest	38.08	1180.50	24.92	772.50	276.500	0.05	0.003

Table IV: Distribution of Differences in Pregnant Women's Motivation regarding Pre-eclampsia Prevention between the Intervention Group and the Control Group at Pretest and Post-test (n=62)

Variable	Result	Intervention		Control		Mann Whitney U	α	P-Value
		Mean Rank	Sum of Rank	Mean Rank	Sum of Rank			
Motivation	*Pretest*	31.60	979.50	31.40	973.50	477.500	0.05	0.966
	Posttest	33.24	1030.50	29.76	922.50	426.500	0.05	0.442

do it. If individuals are motivated, they will make positive choices to do something because it can satisfy their desires[10].

Table II shows an increase in the mean value at post-test knowledge for knowledge and motivation for both groups, which means there is an increase in knowledge and motivation. Based on **Tables III & IV**, the result of the study found at the post-test evaluation, the mean rank value of pregnant women's knowledge about pre-eclampsia prevention for the intervention group, namely 38,08, was higher 13,16 points compared with the control group value; namely 24,92 means the animated video is statistically has impact to increase pre-eclampsia prevention knowledge for pregnant women. Meanwhile, it was found that there was no significant difference between the total score of motivation of pre-eclampsia prevention either for the intervention or control group. However, from additional analysis, there was a difference mean rank score of pregnant women's motivation before and after providing animated videos, namely 3,50 and 11,22, respectively, with Z score= -3,418, p value =0,001. Therefore, all the results of this study answer the research question that animated videos effectively increase knowledge and motivation to prevent pre-eclampsia for pregnant women.

A sufficient knowledge of a problem contributes to its prevention, control and management. Knowledge positively impacts a person's compliance with treatment and reduces complications related to the problem or disease[10]. Education during pregnancy is a fundamental intervention for pregnant women to prevent the incidence of hypertension and pre-eclampsia during pregnancy[11]; this shows that knowledge is related to motivation in preventing pre-eclampsia. Pregnant women will immediately seek medical treatment when they realize the possibility of pre-eclampsia symptoms they are experiencing. Increasing knowledge about pre-eclampsia can be done in various ways, including antenatal visits and other educational media such as videos[8.] Some of the advantages of videos are that the information conveyed is presented excitingly, so it will be easy to remember, there is no limit to distance and time, viewers can play the video anywhere and at any time, and the costs required to make it are less compared to film making[12].

The use of videos, especially animated videos, as a medium for conveying information is more effective because it displays images that are full of color and move so that the information received by individuals will last longer in their memory and make them feel better and satisfied; this can be seen in the post-test scores of intervention and control as a comparison[9]; the results of this study are supported by research conducted by Charland ME 2019[13] which showed that after giving the pre-eclampsia video the level of knowledge in the intervention group was higher compared to the control group with a difference in the value of 19.0%. Moreover, other research shows during ANC education, using video media significantly increases knowledge about risk factors, symptoms and complications in the fetus or newborn, as well as complications in the mothers and their treatment in the incidence of preeclampsia[14]. The results of this research are also in line with research conducted by[15], which shows that mobile-based education effectively increases pregnant women's knowledge about pre-eclampsia. This increased knowledge allows pregnant women to know the signs and symptoms of pre-eclampsia so that they can carry out early detection and management of the condition to reduce the negative impacts that they will experience.

Based on the research results conducted by Ermiati E 2021[16], the mean value before video education was 67.784. It was smaller than after education (86.703). The minimum value before education was 40,000, and the maximum was 88,000. After giving education, a minimum value of 52,000 and a maximum value of 100,000 with a comparison test result using the Paired Samples t-test obtained a p-value of 0.000 <0.05. so this shows a significant difference (meaningful) between the knowledge of pre-eclampsia pregnant women before and after the provision of video

education. This study also obtained comparison test results to analyze the difference in the mean knowledge of pregnant women after education using both media using the Independent Sample t-test and obtained a p-value of 0.854> 0.05. This research shows no significant difference (meaningful) between the average increase in knowledge about pre-eclampsia in the leaflet and video groups.

This study's results related to educational media's influence show that video influences increase the knowledge of pregnant women about pre-eclampsia. When viewing and listening to videos, respondents indirectly capture all the information presented in the video through sound and image movement. Learning media considerably influences a person's trust and opinion, making it easy for respondents to receive and apply information obtained in everyday life. Besides, the study results showed increased pregnant women's knowledge of pre-eclampsia after education using videos and leaflets. The video media and pamphlets can be used by community nurses when providing health education about health, either independently or in collaboration with midwives, to conduct health education for pregnant women. Video media or leaflets can make participants more interested in listening or seeing the material presented in both media. This study also found its limitation because the design does not allow randomization, so the possibility of bias exists, such as the respondent's characteristics may interfere with the intervention's effectiveness. Therefore, further research is needed with a randomized control trial, which should be conducted with a larger group and several observation times.

CONCLUSION

Based on the results of this research, it was found that the animated pre-eclampsia video at the Banda Aceh City Health Center effectively increased knowledge and motivation to prevent pre-eclampsia in pregnant women.

It is recommended that the health service team provide health education in the form of information about pre-eclampsia in pregnant women by utilizing technology. Animated videos can be an option for delivering exciting and flexible information and can be played repeatedly by pregnant women. The animated video media in this research can be a reference for health service teams at community health centres to provide health education related to preventing pre-eclampsia.

ACKNOWLEDGEMENT

We would like to thank the enumerators, participants and all parties who helped us to complete the study.

Ethical permission: Syiah Kuala University, Indonesia, ERC letter No. 111086011222

Conflict of Interest: The authors declare we have *no conflicts of interest* to disclose.

Financial Disclosure / Grant Approval: Research costs are shared by all authors without any financial support.

Data Sharing Statement: The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publically.

AUTHOR CONTRIBUTION

Hermawati D: Formulated the idea and research design, supervised literature review, data analysis and manuscript's preparation.

Harahap IM: Data analysis and data interpretation.

Fitri A: Responsible for collecting literature, reviewing concepts and editing the manuscript.

Juwita R: Helped with data checking and writing manuscript for publication.

All authors have made a significant contribution to study and agreed to be responsible for aspects of the work.

REFERENCES

1. Townsend R, O'Brien P, Khalil A. Current best practice in the management of hypertensive disorders in pregnancy. Integr Blood Press Control. 2016; 9: 79-94. doi: 10.2147/IBPC.S77 344.
2. Gestational Hypertension and Pre-eclampsia: ACOG Practice Bulletin, Number 222. Obstet Gynecol. 2020;135(6): e237-e260. doi: 10.1097/ AOG.000000 0000003891.
3. Indonesia KKR. Indonesia Health Profile 2020. Jakarta; 2021. Available from: https:// www.kemkes.go.id/id/profil-kesehatan-indonesia-2020.
4. Dinas Kesehatan Aceh Singkil. Aceh Singkil Health Profile. Aceh, Health Service. 2021; 1-193.
5. Cunningham F, Leveno KJ, Bloom SL, Dashe JS, Hoffman BL, Casey BM, Spong CY. eds al. Williams Obstetrics 25th Ed. McGraw-Hill Education; 2018.
6. Uno HB. Theory of Motivation and its measurement: Analysis in the field of education. Jakarta: PT Bumi Aksara.; 2016.
7. Mekie M, Addisu D, Bezie M, Melkie A, Getaneh D, Bayih WA et al. Knowledge and attitude of pregnant women towards pre-eclampsia and its associated factors in South Gondar Zone, Northwest Ethiopia: a multi-center facility-based cross-sectional study. BMC Pregnancy Childbirth. 2021;21(1):1-9. doi:10.1186/s12884-021-03647-2.
8. Fondjo LA, Boamah VE, Fierti A, Gyesi D, Owiredu EW. Knowledge of pre-eclampsia and its associated factors among pregnant women: A possible link to reduce related adverse outcomes. BMC Pregnancy Childbirth. 2019; 19(1): 1-7. doi: 10.1186/s12884-019-2623-x.
9. Goad M, Huntley-Dale S, Whichello R. The Use of Audiovisual Aids for Patient Education in the Interventional Radiology Ambulatory Setting: A Literature Review. J Radiol Nurs. 2018; 37(3): 198

-201. doi: 10.1016/j.jradnu.2018.06.003.
10. Notoatmodjo. Metodologi Penelitian Kesehatan. Jakarta: Rineka Cipta; 2010.
11. Yuan P, Yang Y RL. Application of Prenatal Health Education and Nutrition Intervention in Patients with Pregnancy-induced Hypertension. Proceedings of the 8th International Conference on Education, Management, Information and Management Society. Atlantis Press; 2018. doi: 10.2991/emim-18.2018.4.
12. Jatmika SED, Maulana M, Kuntoro, Martini S. Buku Ajar Pengembangan Media Promosi Kesehatan. Yogyakarta: K-Media; 2019. doi: 10.1016/j.jogc.2018.10.003.
13. Charland ME, Côté AM, Girard P, Grenier A, Pasquier JC, Sauvé N. Pre-eclampsia Educational Tool Impact on Knowledge, Anxiety, and Satisfaction in Pregnant Women: A Randomized Trial. J Obstet Gynaecol Canada. 2019; 41(7): 960-70. doi: 10.3389/fcvm. 2022.886679.
14. Gholami K, Norouzkhani N, Kargar M, Ghasemirad H, Ashtiani AJ, Kiani S et al. Impact of Educational Interventions on Knowledge About Hypertensive Disorders of Pregnancy Among Pregnant Women: A Systematic Review. Front Cardiovasc Med. 2022; 9: 886679. doi: 10.3389/ fcvm.2022.886679.
15. Parsa S, Khajouei R, Baneshi MR, Aali BS. Improving the knowledge of pregnant women using a pre-eclampsia app: A controlled before and after study. Int J Med Inform. 2019; 125: 86-90. doi: 10.1016/j.ijmedinf.2019.03.001. Epub 2019 Mar 4.
16. Ermiati E, Puteri AD, Koeryaman MT. The Effect of Health Education Using Video and Leaflet on the Pregnant Women's Knowledge About Pre-eclampsia. J Nurs Care. 2021; 4(1): 229-35.