

The Effect of Educational Media in Increasing Pregnant Women's Knowledge of Flood Disaster Preparedness: Animated Video vs. Pocket Book

Manggiasih Dwiayu Larasati^{1*}, Aiswara Trikusumawardani²

¹STIKes RSPAD Gatot Soebroto, Jakarta, Indonesia

²Sarjana Kebidanan STIKes RSPAD Gatot Soebroto, Jakarta, Indonesia

manggiasih@stikesrspadgs.ac.id, aiswaratw026@gmail.com

ABSTRACT

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Flood disasters can threaten the health of pregnant women and disrupt access to healthcare services, increase the risk of diseases, and cause stress. Disaster preparedness is an important aspect that pregnant women must know and prepare for in the event of a flood. Therefore, education through animation videos and pocketbooks is needed to increase pregnant women's knowledge about flood disaster preparedness. This study uses a Quasi-Experiment "Pretest-Posttest Two Group Design" with two respondent groups: the animation video group and the pocketbook group. The data collection process was carried out from October to December 2024, by accidental sampling. This research involved 62 pregnant women respondents who undergo pregnancy check-ups at the Pondok Gede Health Center, and the data were analyzed using the Mann Whitney test. The results showed that the use of animation videos and pocketbooks had an effect on increasing pregnant women's knowledge about flood disaster preparedness (p-value 0.001). The knowledge of pregnant women about flood disaster preparedness using animation videos increased by 24.94%, while using the pocketbook increased by 38.06%. It can be concluded that the use of educational media, both animation videos and pocketbooks, equally influenced the improvement of pregnant women's knowledge about flood disaster preparedness. However, the use of pocketbooks is more effective in increasing pregnant women's knowledge about flood disaster preparedness compared to animation videos.

ABSTRAK

Bencana banjir mengancam kesehatan ibu hamil dan mengganggu akses pelayanan kesehatan, meningkatkan risiko penyakit, serta menimbulkan stres. Kesiapsiagaan bencana merupakan aspek penting yang harus diketahui dan dipersiapkan oleh ibu hamil saat terjadi banjir. Oleh karena itu, edukasi melalui video animasi dan buku saku diperlukan untuk meningkatkan pengetahuan ibu hamil tentang kesiapsiagaan bencana banjir. Penelitian ini menggunakan desain *Quasi-Experiment "Pretest-Posttest Two Group Design"*, kelompok video animasi dan buku saku. Pengumpulan data dilakukan mulai bulan Oktober s.d Desember 2024, dengan Teknik *accidental sampling*. Penelitian ini melibatkan 62 ibu hamil yang melakukan pemeriksaan kehamilan di Puskesmas Pondok Gede, data dianalisis menggunakan uji Mann Whitney. Hasil penelitian menunjukkan bahwa penggunaan video animasi dan buku saku berpengaruh terhadap peningkatan pengetahuan ibu hamil tentang kesiapsiagaan bencana banjir (p-value 0,001). Media video animasi meningkatkan pengetahuan sebesar 24,94%, sedangkan buku saku meningkat sebesar 38,06%. Dapat disimpulkan bahwa penggunaan media edukasi, baik video animasi maupun buku saku, sama-sama berpengaruh terhadap

peningkatan pengetahuan ibu hamil tentang kesiapsiagaan bencana banjir. Namun, penggunaan buku saku lebih efektif dalam meningkatkan pengetahuan ibu hamil tentang kesiapsiagaan bencana banjir dibandingkan dengan video animasi.



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A. INTRODUCTION

Natural disasters, particularly floods, are one of the most frequent disasters in Indonesia and can seriously impact the health of pregnant women. The physical and psychological impacts of these disasters have the potential to increase the risk of pregnancy complications, making flood preparedness crucial for pregnant women. Data from the National Disaster Management Agency (BNPB) shows that floods are the most frequent disaster, with a wide-ranging impact on the community, including pregnant women who are vulnerable to stress and other health problems in emergency situations (BNPB, 2020).

The stress and anxiety experienced by pregnant women during disasters can also affect their mental and physical health. Prolonged stress can even cause contractions, potentially leading to miscarriage or premature birth (Ermawati, 2021). Data shows that the majority of disaster victims (60-70%) in Indonesia are pregnant women, children, and the elderly. Pregnant women require assistance to save themselves. The assistance provided is also different from other victims, as pregnant women require special attention and observation, as it concerns the safety of both the mother and the fetus (Madeni, B., MS, S. W., & Hasritawati, 2024). Furthermore, pregnant women are also a vulnerable group during disasters (Wahyuni, 2021).

Increasing pregnant women's knowledge about disaster preparedness is crucial to reduce potential risks. Therefore, various efforts are being made to increase this knowledge, one of which is through the use of educational media. Effective educational media can facilitate pregnant women's understanding of the steps to take before, during, and after a flood. Some commonly used media types are animated videos and pocket books. Animated videos provide engaging and easy-to-understand visual explanations, while pocket books provide practical information that is easy to carry and access anytime.

The floods that hit Bekasi affected 7,253 people from 1,822 families, one of which was in Pondok Gede, where the water level reached 80-100 cm (Dewanti, 2024). According to the InaRisk disaster risk assessment index, the flood risk in Bekasi City ranges from moderate to high. In response to this risk, the National Disaster Management Agency (BNPB) reminds residents to remain vigilant and take preventative measures (Bomantama, 2021). Based on a preliminary study of 10 pregnant women in the Pondok Gede Community Health Center (Puskesmas) area, only three were aware of flood preparedness and reported learning about it through social media. The majority of them, 7 pregnant women, were unaware of flood disaster preparedness and had never received any education. This situation underscores the need for education to improve pregnant women's knowledge and preparedness for flooding.

Previous studies have shown that visual educational media, such as animated videos, have advantages in improving memory and comprehension of information compared to traditional text-based methods (Hansen S, Jensen TS, Schmidt AM, Strøm J, Vistisen P, 2024; Mayer, 2009). Animated videos can illustrate processes or procedures in a dynamic and interactive manner, making them easier to understand for audiences with various educational backgrounds. On the other hand, pocket books are still considered an effective tool for providing concise and practical information.

This study aims to compare the effects of two types of educational media, animated videos and pocket books, in increasing pregnant women's knowledge regarding flood disaster preparedness.

B. METHODS

The type of research conducted was quantitative with the Quasy Experiment method "Pretest-Posttest Two Group Design". The data collection process was carried out from October to December 2024 in the working area of the Pondok Gede Community Health Center. The questionnaire was valid and reliable, with item validity coefficients of 0.580–0.829 (r -table = 0.561) and a Cronbach's alpha of 0.87, indicating high reliability. Then the sample was selected using an accidental sampling technique that met the inclusion and exclusion criteria. Accidental sampling was used to recruit pregnant women in flood-prone areas who were readily accessible during the study period, enabling efficient assessment of their knowledge on flood disaster preparedness. Ultimately, this study involved a total of 62 pregnant women respondents consisting of 31 pregnant women in the animated video treatment group and 31 pregnant women in the treatment group using educational media pocket books. Initially, pregnant women in each group were given a pretest to determine their understanding of flood disaster preparedness. Pregnant women attending antenatal care who had not previously received flood disaster mitigation education were assigned to two groups: one received a pocket book and the other an animated video. Educational sessions were delivered directly by the researchers, and pre- and post-intervention knowledge scores were compared to evaluate which medium was more effective. Data were analyzed using the Mann Whitney statistical test on IBM SPSS Statistics 22 software. Differences were considered significant if the p value was <0.05 .

C. RESULT AND DISCUSSION

1. Result

a. Knowledge of pregnant women before being exposed to animated videos or given the pocket book media

Table 1. Frequency distribution of knowledge of pregnant women before being exposed to animated videos or given the pocket book

Pregnant women's knowledge about flood preparedness	Before being exposed to			
	Animated videos		The pocket book media	
	f	%	f	%
Good	11	35,5	10	32,2
Fair	15	48,4	15	48,4
Poor	5	16,1	6	19,4
Total	31	100,0	31	100,0

Based on Table 1, showed that among the pregnant women who received the animated video intervention, 11 respondents (35.5%) had good knowledge, 15 (48.4%) had fair knowledge, and 5 (16.1%) had poor knowledge. In the pocket book group, 10 respondents (32.2%) demonstrated good knowledge, 15 (48.4%) had fair knowledge, and 6 (19.4%) had poor knowledge. These results provide a descriptive overview of knowledge levels in each intervention group, facilitating preliminary comparison of the effectiveness of the two educational media.

b. Level of knowledge after being given animated video media or pocket books

Table 2. Frequency distribution of knowledge of pregnant women after being given educational media in the form of animated videos or pocket books

Pregnant women's knowledge about flood preparedness	f	%
After being given the Animation Video		
Good	31	100,0
After being given the Pocket Book		
Good	31	100,0

Based on table 2, it is known that all pregnant women had good knowledge after being given educational media in the form of animated videos or pocket books, each with 31 respondents (100.0%).

c. Average knowledge before and after being given animated video media and a pocket book

Table 4. Average knowledge before and after being given animated video and a pocket book

Educational Media			n	Mean	SD	Mean Rank	p value
Animated Video	Pregnant Women's Knowledge	Before	31	14,39	2,996	29,94	0,001
		After	31	19,13	0,991		
Pocketbook	Pregnant Women's Knowledge	Before	31	13,94	3,119	38,06	
		After	31	19,84	0,374		

Based on Table 4, it is known that the average knowledge before the animated video intervention was 14.39 and the pocket book was 13.94. However, after the video media intervention, the average knowledge became 19.13 and the pocket book was 19.84.

2. Discussion

Knowledge is the primary foundation for individuals in flood mitigation and preparedness, particularly regarding the health impacts of flooding and the steps that can be taken to mitigate these impacts. The higher a person's knowledge level, the better their ability to assess and understand an object or situation. This assessment can then serve as a strong foundation for taking appropriate action or implementing effective practices to address various challenges (Notoatmodjo, 2018).

Before the intervention, the results of this study indicated that respondents' levels of knowledge regarding flood disaster preparedness varied, with the majority having poor to adequate knowledge. This finding aligns with research conducted by Maayah et al., 2023, which found that 54.2% of respondents had low levels of knowledge regarding flood disaster preparedness (Maayah, N., Subki, S., & Burdah, 2023). The frequency of pregnant women with low levels of knowledge indicates that their access to flood disaster preparedness information is still limited and they are unaware of its importance. This can be caused by various factors such as lack of access to reliable sources of information, a lack of interesting and easy-to-understand educational activities, and education regarding flood disaster preparedness is still relatively rarely provided in many areas.

Disaster preparedness in individuals and communities is also influenced by the amount of information obtained. Various efforts can be made to obtain information related to disaster mitigation, one of which is by learning about disaster preparedness through electronic or print

media (Maayah, N., Subki, S., & Burdah, 2023). Based on the results of the study, the knowledge of pregnant women about flood disaster preparedness shows that the majority of respondents have a sufficient level of knowledge, namely 15 respondents (48.8%). This result is in line with research conducted by (Hidayanto, 2020) which shows that the number of vulnerable groups who have a level of knowledge of flood disaster preparedness in the poor category is 63.6% of respondents (Hidayanto, 2020). These findings indicate that despite living in flood-prone areas, many pregnant women still have limited knowledge of flood disaster preparedness, reflecting a gap in awareness of its critical importance. The researchers argue that this gap is likely due to the uneven distribution of educational resources and the absence of routine, structured disaster preparedness education. Such deficiencies hinder pregnant women from developing adequate understanding and proactive behaviors necessary to mitigate flood risks. Therefore, targeted and consistently delivered educational interventions, such as animated videos or pocket books, are essential to enhance knowledge, raise awareness, and strengthen preparedness among this vulnerable population.

Based on the recapitulation of the Pretest questionnaire, it was found that the majority of pregnant women with good knowledge were familiar with aspects of flood prevention. This indicates that pregnant women understand the importance of maintaining environmental cleanliness as a preventive measure in reducing the risk of flood disasters. However, although knowledge regarding prevention is quite good, the results also show that their knowledge is still lacking in the aspect of preparedness. This finding is in line with the results of a study conducted by (Panda, 2024) that although the community has a high awareness of prevention, their understanding of the steps to be taken in emergency situations is still low (Panda, 2024). Therefore, public awareness will make them more prepared and alert in facing disasters, then the impact of losses can be minimized. Research conducted by (Asrawaty, Arie Maineny, 2024) also emphasizes the importance of increasing awareness and knowledge about how to deal with disasters, including protecting vulnerable groups, which needs to be pursued in order to strengthen preparedness (Asrawaty et al., 2024). According to the researchers' assumptions, although pregnant women are aware of the importance of taking preventative measures to deal with potential disasters, they are still not fully prepared in terms of flood disaster preparedness. Therefore, despite good awareness regarding preventative measures, further education regarding flood preparedness is still needed. With increased knowledge, it is hoped that pregnant women will be better prepared and responsive in dealing with emergency situations such as floods, thereby effectively reducing potential risks.

The post-test results showed a significant increase in respondents' understanding. All respondents (100%) answered correctly. This indicates that respondents gained a deeper understanding after going through the pre-test and education sessions. However, regarding preparedness, 13 respondents (21%) still had not memorized important numbers such as ambulance and fire department numbers. This is in line with research conducted by Mulyadi et al., 2023, which showed that educational programs effectively increase public understanding of preparedness (Mulyadi, M., Rosadi, B., & Rumiasari, 2023). The study indicates that pregnant women who participated in structured educational interventions demonstrated higher levels of flood disaster preparedness compared to those who did not receive education. These findings highlight the critical role of tailored educational media in not only conveying knowledge but also promoting practical application. Specifically, interventions such as animated videos or pocket books can enhance understanding, retention, and implementation of preparedness measures, ensuring that pregnant women are better equipped to respond effectively in flood-prone areas.

The average knowledge of respondents before being given the animated video educational media intervention was 14.39%, while respondents who were given the pocket book had an average knowledge of 13.49%. This indicates that both groups had relatively similar levels of

basic knowledge before the intervention with educational media. After the animated video educational media intervention, the results showed a significant increase in average knowledge. Respondents who received the intervention through animated video media had an average knowledge increase of 19.13%. The results of this study are supported by (Rahmawati, 2021) who stated that there was a difference in the average knowledge of pregnant women before and after being given animated video media (Rahmawati, 2021). This is in line, which stated that video media is an effective tool in the learning process, including during health education (Aisah, 2021). The combination of attractive visuals makes it easier for respondents to understand the information conveyed and enjoy the process of knowledge transfer.

Respondents in the pocketbook group also experienced an average increase in knowledge from 13.49% to 19.84% after being given the pocketbook media intervention. This study aligns with the results of (Kirnantoro & Maryana, 2022) which showed an effect of health education using pocketbooks on the knowledge of pregnant women (Maryana, 2022). These results are supported by research (Suparsih et al., 2021) which showed an effect of health education using pocketbooks on the knowledge of pregnant women (Suparsih, Widyastutik, D., & Rohmatika, 2021). Pocketbooks are effective in increasing respondents' knowledge because they are attractive enough to be studied as a source of information, and pocketbooks, with their attractive format, are used as tools for health education activities. The researchers assume that the observed increase indicates that both intervention methods, both animated videos and pocketbooks, have proven effective in increasing respondents' knowledge. Animated videos provide the advantage of attracting attention and facilitating understanding through engaging and interactive visualizations. Meanwhile, pocketbooks allow respondents to access information independently and in a focused manner or to repeat learning as needed.

Based on the results of the Mann Whitney test, there is a difference in the average influence of animated video media and pocket books (p value 0.001), and the Mean Rank of knowledge for the animated video media group is 24.94 and the knowledge for the pocket book media group is 38.06. From this average difference, it can be concluded that pocket book media is more effective than animated video media, the results of this study are supported by (Yasri, 2024) who stated that pocket book media is more effective than animated video media in increasing the knowledge of pregnant women (Yasri, 2024). According to (Notoatmodjo, 2018), the delivery of information is greatly influenced by the methods and media used in the process. The methods and media for delivering information have the potential to have a significant impact on increasing individual knowledge. By using the right method and appropriate media, information can be delivered more effectively and efficiently, so that individual knowledge can increase more optimally (Notoatmodjo, 2018; Septiana KS, Adnani QES, Susiarno H, Tarawan VM, Arya IFD, 2025). Various studies have shown that the use of appropriate methods and media in delivering information can significantly increase individual understanding and knowledge. Education provided through various electronic or print media can improve individual knowledge on certain topics better than less appropriate information delivery methods.

Therefore, it is important to consider the methods and media used in conveying information to maximize knowledge. The analysis of the research conducted shows a significant increase in the knowledge of pregnant women before and after they were educated about flood preparedness. The education provided a deeper understanding of the steps to take in the face of potential flooding, enabling them to be better prepared and able to protect themselves and their families. The analysis of the research above shows an increase in knowledge before and after the education on flood preparedness was provided to pregnant women.

Providing media in the form of pocket books plays a significant role in increasing the knowledge of pregnant women. According to Hanif et al, a pocket book is a small book that can be kept in a pocket, is lightweight, and easy to carry. Despite its small size, a pocket book can

provide comprehensive information, is easy to read, attracts the audience's interest, can be read repeatedly, and can be studied according to the reader's needs (Hanif, M. F., Ririanty, M., & Nafikadhini, 2019). The results of this study are in line with research (Suparsih et al., 2021) which stated that the use of pocket books is effective in increasing knowledge (Suparsih, Widyastutik, D., & Rohmatika, 2021). Pocket books can be used to convey messages about health behaviors, and pocket books have advantages including durability, reach a wide audience, are inexpensive, can be carried anywhere, facilitate understanding, and increase enthusiasm for learning. Other studies also indicate that there is an effect of health education through pocket books on the knowledge of pregnant women (Ristini, 2024).

D. CONCLUSION AND SUGGESTIONS

Educational interventions, regardless of the medium used, play a significant role in enhancing knowledge and awareness of disaster preparedness among vulnerable populations, such as pregnant women. Structured and targeted health education can foster understanding and promote proactive behaviors that are essential for reducing risks during emergencies. However, this study has limitations, including a relatively small sample size and non-randomized sampling, which may affect the generalizability of the findings. Future research should consider larger, randomized samples, evaluate the long-term retention and behavioral application of knowledge, and explore the comparative or combined effects of different educational media to optimize disaster preparedness outcomes across diverse communities.

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