

The Effectiveness of Audiovisual Media Health Education on Flood Disaster Preparedness in Elementary School Children

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ARTICLE INFO

Article History:

Submitted: 04-01-2023

Reviewed: 06-01-2023

Revised: 01-02-2023

Acepted: 04-02-2023

Keywords:

Audiovisual Media,

Health Education,

Flood Disaster

Preparedness

ABSTRACT

Flood disaster preparedness is necessary to provide information to reduce the impact of the disaster on human life and surroundings. This research aims to analyze the effectiveness of health education about flood disaster preparedness students at elementary school students. This research used pre-experimental designs with one group pretest-posttest design type. The Sample in this study involved 20 students in 5th grade obtained with total sampling. The research instrument utilized a flood disaster preparedness questionnaire. Before being given health education, most students' knowledge was in ready and almost ready categories, with seven students for each level (35%). The result of the post-test showed that students' knowledge levels were at a very ready category of as many as five people (25%), ready level of as many as five people (25%), and almost ready as many as eight people (40%). This study concludes that there were differences in students' knowledge before and after being given health education ($p: 0.032$, $\alpha: 0.05$). This show that health education on flood disaster preparedness through audiovisual media effectively increases the knowledge students of in elementary school. Therefore, audiovisual-based education can be used as an alternative medium to provide health education for students.

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I. INTRODUCTION

Disaster preparedness is a series of actions, preparations, and activities to anticipate all disaster hazards that threaten life and individual survival.

Everything is done in an organizational setting in dealing with the respective threats of an impending disaster by carefully and efficiently arranging plans (UU No. 24 of 2007 in Purwoko, 2015).

Disaster preparedness emphasizes efforts to prepare appropriate, fast and responsive capabilities in dealing with disaster management which aims to reduce the effects experienced when a disaster occurs (Pratiwi, 2016 in Ferianto & Hidayati, 2019). There are main parameters divided into four categories in disaster preparedness: knowledge and attitudes, planning for emergencies, early warning systems and mobilizing resources. These four parameters determine the main disaster primary reduction outcome if it occurs in an area. Decreasing parameters can lead to increased risk due to these disaster events (Aprilin et al., 2018).

Indonesia ranks fourth in the table of the most natural disaster events in the Asia-Pacific with the number of occurrences of 312 disasters. It ranks second in the table of the highest number of deaths caused by natural disasters in the Asia-Pacific, until the last decades (1980-2009) of 191,164 people (ISDR, 2010). The BNPB center noted that more than 100 people died due to the floods and 17 others disappeared. The East Java Regional Disaster Management Agency (BPBD) reported that in 2020 there were 386 disaster incidents. From

Of the 2,384 disasters in Indonesia, 98% were hydrometeorological disasters such as tornadoes, tsunamis, landslides and

floods. (BNPB, 2020). This data increased by 32% from 2015-2016 due to environmental degradation, climate change, weather, critical rivers and spatial planning that still needed to discuss needed total aspects. The 2013 BNPB Indonesia Disaster Risk Index (IRBI) explains that the high-risk disaster areas with the top three rankings in this indication are Lumajang Regency, Malang Regency and Jember Regency are in third place. This shows that Jember is a disaster-prone area with a high index (East Java Regional Disaster Management Agency, 2020). The study team from The Study on Natural Disaster Management in Indonesia (2007) shows high-risk areas for floods in Jember are areas with dense populations, such as Panti, Kaliwates, Silo and Patrang sub-districts. She was followed by moderate risk areas, namely Jenggawah, Ambulu, Puger, Balung, Gumukmas and Kencong Districts.

Education on disaster preparedness should be taught to all people, including children at the elementary school level. Schools are educational centers that provide knowledge and survival knowledge, one of which is preparedness skills. Disaster prevention should be a focus in schools by empowering students to understand signs and choose steps to reduce risk as an essential stage in the core

of increasing the value of preparedness (Permana, 2015). If children's knowledge of disasters is good, they can create a generation that is disaster resilient and has good disaster preparedness.

Children who act as students are among the most vulnerable groups in disaster situations. Based on data from the United International Strategy for Disaster, it is stated that as many as 60% of disaster victims are children (Andina, 2010 in Permana, 2015). This is directly proportional to the fact that 66 million children per year are affected by disasters. This problem can occur due to limited ability and resources to anticipate or prepare yourself when you feel afraid so you depend on other, more mature people. This vulnerability is triggered by the lack of interpretation regarding the risks surrounding them, resulting in a thick absence preparedness in dealing with disasters (Permana, 2015).

SDN 01 Kemiri is located on Jalan Teropong Desa Kemiri which generally has a slope of 36-40 degrees which can be categorized as having a steep slope with the potential for flash floods. Kemiri Village is the village most frequently hit by floods with the most severe history in 2006. According to the principal of SDN 01 Kemiri, around 85% of students have experienced flooding. And also most of the

students live in Kemiri village, so students are at risk of flooding. For his reason, preparedness education is needed in these schools.

Increasing the value of disaster preparedness with health education methods must use a good and correct conceptual form that begins with cognitive behavior towards affective behavior and then continues with psychomotor behavior (Sulastri, 2018). The choice of the method when providing disaster preparedness education to early childhood can appropriately support the process of conveying information correctly, so that the objectives of providing disaster preparedness education can be achieved (Hutami et al., 2014). Information related to disaster preparedness can be provided with auxiliary media to facilitate the process of delivering material (Notoatmodjo, 2010). Interactive and interesting media reveal objects and events as they are, which can help the process of receiving information be more quickly accepted, understood and remembered by the public (Anggraiet al. al, 2020). Three kinds of media aids can be used to provide preparedness education to children, including visual aids applied in brochures and leaflets (visual media), hearing aids applied in the form of sounds or songs (audio media) and visual aids. And They

are ng which is used in the form of video (audiovisual media) (Wilujeng and Handaka, 2017). Combining two or more educational media can increase understanding and acceptance by 83% more effectively thaeffectively one auxiliary media (Hikmawati, 2011). This is supported by other research stating that learning media with visualization and real media can increase internal understanding and preparation for dealing with floods. (Feryanto & Uci, 2019).

2. METHODS

This type of research is an experiment with quantitative research methods and a pre-experimental design (one group pretest-posttest). The population in this study were all 20 students from grade 5 SDN 01 Kemiri. The researcher used a total sampling technique using the inclusion criteria in this study:

students at SDN 01 Kemiri grade 5 who were physically healthy. The exclusion criteria in this study were students who were sick. Completing questionnaires related to flood disaster preparedness totaling 25 questions showing r count 0.4521-0.8246 and Cronbach 0.929 (Permana, 2015). Data collection was carried out from 2 June to 12 June 2022. Data analysis used the Wilcoxon test $p=0.05$. This research was declared to have passed the ethical competency test through the KEPK of the Faculty of Nursing, University of Jember with No. 069/UN25.1.14/KEPK/2022.

3. RESULTS

Characteristics of Respondents

The characteristics of the respondents studied were the age and gender of the 5th-grade students at SDN 01 Kemiri.

Table 1. Characteristics of respondents based on age at SDN 01 Kemiri class 5 (n=20)

No.	Age	Frequency (n)	Percentage (%)
1	10	2	10
2	11	11	55
3	12	7	35
Total		20	100

The interpretation in the table above shows that the characteristics of respondents based on age have the most results, namely children aged 11 years with

a percentage of 55%. The youngest grade 5 students at SDN 01 Kemiri is ten years old with a percentage of 10% and the most

senior grade 5 students at SDN 01 Kemiri

with 35%.

Table 2. Characteristics of respondents based on gender at SDN 01 Kemiri class 5 (n=20)

No.	Age	Frequency (n)	Percentage (%)
1	Male	8	40
2	Female	12	60
Total		20	100

Based on table 2 shows the characteristics of respondents based on gender. The result is that most respondents

are 12 female students (60%) and male students (40%).

Table 3. Characteristics of respondents based on gender at SDN 01 Kemiri class 5 (n=20)

No.	Age	Frequency (n)	Percentage (%)
1	Male	8	40
2	Female	12	60
Total		20	100

Table 2 shows the characteristics of respondents based on gender. The result is that most respondents are 12 female

students (60%) and eight male students (40%).

Preparedness for Flood Disasters

Table 4. results of the flood disaster preparedness

No.	Category	Pre-test		Post-test	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
1	Very ready	0	0	5	25
2	Ready	7	35	5	25
3	Almost ready	7	35	8	40
4	Not quite ready	6	30	2	10
5	Not ready	0	0	0	0
Total		20	100	20	100

Based on pre-test measurements on the table results related to flood disaster preparedness, all students have a category of flood disaster preparedness with the

most details in the ready and almost ready categories, namely seven students (35%) each. In comparison, the unprepared category is six students. (30%) and there

are no students in the very prepared category.

Based on the post-test measurement results table related to flood disaster preparedness shows that after being given an intervention, all students have a flood disaster preparedness category with details of very ready and ready each of 5 students (25%), almost ready category of 8 students

(40%). However, two students (10%) were found to need to be prepared.

This study's flood disaster preparedness variable is represented by three indicators: attitudes and knowledge, emergency planning and early warning systems. The distribution of flood disaster preparedness indicators for class 5 elementary school students is presented in the table below.

Table 5. Attitude and Knowledge Indicators Related to Flood Disaster Preparedness among class 5 Elementary School Students at SDN 01 Kemiri (n=20)

Indikator	Pre-test		Post-test	
	Mean	SD	Mean	SD
Attitude and Knowledge	13,73	5,17	14,73	4,81
Emergency Planning	11,00	6,16	11,40	6,20
Early Warning System	9,25	4,99	10,50	3,78

Based on the table above it is known that the three indicators have a standard deviation value lower than the mean, which means that the mean value can be used as a representation of all data. Of the three indicators above, attitudes and knowledge are indicators that have the highest mean values, namely 13.73 (pretest)

and 14.73 (posttest) with a standard deviation of 5.17 (pretest) and 4.81 (posttest). This means that attitude and knowledge indicators are part of flood disaster preparedness that most influence 5th-class elementary school students at SDN 01 Kemiri.

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Table 6. Differences in flood disaster preparedness before and after being given health education interventions with audiovisual media

No.	Category	interventions		Sig. Value
		Pre	Post	
1	Very ready	0	5	p =0,032
2	Ready	7	5	
3	Almost ready	7	8	

4	Not quite ready	6	2		
5	Not ready	0	0		
Total		20	20	20	100

Based on the table of results, the difference in pretest-posttest values in the table above shows that there has been a change in the flood disaster preparedness of students at SDN 01 Kemiri before and after health education. Before health education about flood disaster preparedness was carried out, the level of knowledge in the very prepared category still needed to be created. Still, after the health education was carried out it increased quite a lot, namely five students (25%), and the ready category decreased from 7 to 5 students (28%). The almost ready category increased from 7 to 8 students (12.5%), and the less prepared type decreased from 6 (34.5%).

In addition, the results of the Wilcoxon statistical test obtained a p-value of 0.032. The decision was made by looking at the degree of error ($\alpha = 0.05$) and because the p-value < 0.05 , it can be concluded that H_0 was rejected, which means that there is an influence of health education on flood disaster preparedness for elementary school students at SDN 01 Kemiri.

4. DISCUSSIONS

Characteristics of Respondents

a. Age

The results in this study indicate that the features of respondents based on age have the most results, namely children aged 11 years with a percentage of 55%. The youngest grade 5 student at SDN 01 Kemiri is ten years old with a percentage of 10% and the most senior grade 5 student at SDN 01 Kemiri is 12 years old with a percentage of 35%. This is in line with Widjanarko and Minafah 2018 research entitled "The Influence of Disaster Education on Student Preparedness Behavior" where this study used class 5 Elementary School participants who used discussions, watched environmental videos and also practiced outside with trees that grow around the school and river (Widjanarko and Mifanah, 2018). In the study entitled "Providing Flood Disaster Counseling on the Preparedness of Class VI Students in Facing Flood Disasters" conducted at SD Negeri II Padang Sambian, the age distribution of the respondents mainly was 12 years old with a percentage (63.8%) followed by respondents aged 11 years with percentage (18.8%) with the extension method (Sulisnadewi et al., 2017).

The age factor is an individual variable in which individuals absorb more and more information as they get older, affecting their productivity, which is disaster preparedness behavior in this context. (Gibson et al, 1987; Widjanarko and Minnafah, 2018). This is supported by Herdwiyanthi's research (2012) in which school-age children have limited resources and skills in preparing for and dealing with disasters, making them dependent on the other hand. Factors that limit children's understanding of the risks around them result in them being unprepared to face disasters (Herdwiyanthi, 2012 in Widjanarko, 2018). Age is one of the factors that influence one's knowledge. Age affects physical and mental development. A person's psychological development is in a more mature and mature direction. According to Firmansyah's research (2014) entitled "Relationship of Knowledge and Preparedness Behavior in Facing Floods and Landslides in Adolescents Aged 15-18 Years" which stated that the older they get, the more knowledge about disasters and disaster preparedness increases (Firmansyah, 2014).

b. Gender

The results of this study indicated that the gender characteristics of the respondents meant that the majority of respondents were 12 female students

(60%) and eight male students (40%). Gender is a biological, genetic difference that separates a person from male or female (Evelyn, 2016). The characteristics based on gender are mentioned in Haryani's research (2018) entitled "Preparedness for School-Based Disasters" which states that gender does not see boys as better or girls as having an influence, where there are no gender limitations in terms of knowledge, attitudes and actions (Haryani, 2018).

Women dominated the sex of the respondents in this study. This is to the 2021 East Java BPS data report showing the population in Jember Regency of a total of 2,550,360 residents; the female sex is the most populous, namely 1,278,825 residents (50.14%) even though the male sex of the population is as much 1,271,535 residents (49.86%) (BPS, 2021).

Flood Disaster Preparedness Before and After Intervention

The research results showing the pretest scores related to flood disaster preparedness showed that all students were in the most detail in the ready and almost ready categories, namely seven (35%) each. In comparison, the unprepared type was six students (30%).

Disaster preparedness is an effort to anticipate the possibility of a disaster so there are no casualties, property loss, and

changes in people's lives (Khambali, 2017).

Disaster preparedness indicators used in this study are attitudes and knowledge, emergency planning and early warning systems. In this study flood disaster preparedness was measured using an adaptation questionnaire from LIPI UNESCO/IDR 2006 from the previous researcher, Permana in 2015 which consisted of the following indicators:

a. Attitude and Knowledge

In this study attitudes and knowledge have the highest mean value of the other indicators. This suggests that attitudes and knowledge are things that have an important influence and many benefits are felt on flood disaster preparedness for elementary school students; this opinion is in line with Yatnika et al.'s research (2020) entitled "The Influence of Knowledge and Attitudes on the Preparedness of Heads of Families in Facing Flood Disasters" which in this study said attitudes and knowledge influence individual attitudes and concerns about preparing for disaster risk reduction to minimize the impact of disasters, especially for individuals/groups living in disaster-prone areas. (Yatnika, 2020). Notoadmojo (2007) also explained that an increase in personal knowledge would be directly proportional to the rise in the attitude and behavior of the individual.

b. Emergency Planning

Based on the results of this study, the emergency planning indicator has the highest average order number 2 of the other indicators. This also suggests that emergency planning indicators influence elementary school children's disaster preparedness. Emergency planning is related to evacuation and rescue actions, which are useful in helping victims to be minimized (Firmansyah, 2014). This indicator covers what to do to save yourself from flooding, such as: more knowledge about flooding, evacuation or evacuation locations, knowing where to protect yourself in case of a flood and first aid. Facts on the ground also support, that in the village of Kemiri if it rains with high rainfall it is inevitable that it will experience flooding. As floods frequently occur, the children's experiences can contribute to their knowledge of emergency plans. This is in line with Erlia et al.'s research (2017) entitled "Analysis of Community and Government Preparedness for Floods in Martapura Barat District, Banjar Regency" where in the results of data analysis, respondents reflected that emergency planning in their village had been good enough by providing medicine and food for its citizens. This is not for any reason, but the Martapura area

has a history of frequent flooding (Erlia et al., 2017).

c. Early Warning System

Based on the research results, early warning system indicators are ranked last or third in flood disaster preparedness indicators. This means that there still needs to be more knowledge among elementary school students in Kemiri Village regarding the disaster early warning system. The early warning system includes warning signs and sharing information when a disaster is approaching. It can be said that the community is good at understanding the information provided by warning signs and what to do when warning signs sound (Erlia et al., 2017). This is in line with Yatnika's research, 2020 where the early warning system for heads of households is still at an unprepared index, so it is important to immediately carry out outreach, facilitation and training regarding the early warning system before a flood disaster occurs (Yatnika, 2020).

Based on the results of research related to disaster preparedness (pretest), it was found that the results were still at a low index. According to the researchers, students as children who are a vulnerable group in disaster events must have an attitude of preparedness in dealing with

any disaster including floods, because the damage caused by disasters is primarily determined by the skills, knowledge and abilities acquired by the individuals themselves. Therefore disaster preparedness must be prepared to minimize losses.

While the results of the knowledge level research in the form of posttest scores related to flood disaster preparedness showed that all students had disaster preparedness with the details of the very ready and ready categories of 5 students (25%) each, the almost ready category of 8 students (40%). However, two students (10%) were found to need to be prepared. The description of the research results in posttest scores shows an increase in the category level but also a decrease in the category. An increase in flood disaster preparedness occurred in the majority of students, namely as many as 18 students (90%) and students who experienced a decrease in flood disaster preparedness occurred in 2 students (10%).

At the posttest stage, student scores show better preparedness. This means that students already understand and understand information related to flood disaster preparedness by the statements given. This good knowledge can occur because of the cognitive enhancement factor and students' memory. This is by

Hanifah's explanation (2020) which says that children who receive new information that is entered in a structured and continuous manner will have an impact on cognitive improvement in these children (Hanifah, 2020). Another explanation, namely Piaget's theory (1936) explains that at the age of 7-12 years, children are at a stage of development where children have systematically so that children can process information (Marinda, 2020). According to the researchers, this can help to work correctly so that there is an increase in knowledge for most students. Students get new information then the following process is how they can apply their thinking skills so that the information is easily recovered. In this case, the student's memory in remembering that information matters.

However, there are still students with low scores in the lower category; the researcher assumes that there are obstacles such as learning media that students can capture may vary from one student to another. This matter is to Harun's presentation which explains that students have different learning characteristics and children learn according to the stages of the child itself, so each child can have another distinctive way of capturing learning at school or home (Harun, et al., 2020).

Knowledge is a person's conceptual ideas and understanding obtained from the senses of sight and hearing and processed into information in the form of memories and stimuli (Fernalia et al., 2021). This is to Wulandar's research (2018) which showed that before health counseling 63.83 students were in the almost ready category, with the percentages being very ready (10%), ready (32%), and almost ready (44%), less ready (12%) and not ready (2%), while the level of readiness of students in responding to the tsunami disaster after health counseling with a score of 78.79 with the ready category the percentage is very ready (46%), ready (36%), almost ready (16 %), unprepared (2%) and unprepared (0%) (Wulandari, 2018). Flood-related knowledge focuses on the community's understanding of flood-prone areas including types of disasters, signs of disaster, coverage areas, evacuation strategies, and disaster information needed by the community. The level of community knowledge is the key to determining attitudes and concerns regarding a problem condition, in this case a disaster-related problem (Adiwijaya, 2017 in Keraman et al., 2021).

The results of the posttest research showed an increase in student knowledge related to flood disaster preparedness at SDN 01 Kemiri. With increased

knowledge, students of SDN 01 Kemiri can raise awareness and concern in implementing attitudes and behavior regarding disaster preparedness, especially flood disasters. KPBI said that one of the factors that influence the attitude and behavior of disaster risk reduction is the knowledge factor, which in this case can be improved through disaster risk reduction training (KPBI, 2011 in Saparwati, 2020)

The Effectiveness of the Health Education Method Through Audiovisual Media on Increasing the Value of Flood Disaster Preparedness

The research results on flood disaster preparedness knowledge before conducting health education still need to be included; given health education interventions on disaster preparedness using audiovisual media there was an increase. They are shown by the majority of respondents in the very ready and ready category as many as ten people (50%) with five people in each category (25%). The Wilcoxon Signed Rank test results obtained a significance value or p-value of 0.032, which means that $p < 0.05$. Based on this, the results can be obtained which show that in this study the alternative hypothesis (H_a) is accepted and H_0 is rejected. So it can ults of this study means that providing health education through

audiovisual media is an effective method for increasing the value of disaster preparedness for grade 5 students at SDN 01 Kemiri.

From the results of the study, it can be seen that there are differences in the level of disaster preparedness knowledge of students at SDN 01 Kemiri. This proves that students can receive information related to disaster preparedness very well and enthusiastically. This is in line with the explanation of Notoadmojo (2007) which states that an increase in the knowledge possessed by a person is correlated with an increase in that person's behavior. Starting from individuals who receive new information that is useful for themselves and maybe for their family members so they try to digest this information. Then the individual begins to consider the good and bad of the information received for further evaluation related to that information. And implementing the information obtained is the final stage of increasing knowledge (Aprilin, 2018).

According to Notoatmodjo (2010), changing knowledge is a learning stage. The learning process will be effective if the stimulation given is by individual needs. Health education is one of the factors that influence knowledge. Especially in health education, interesting learning methods and media are needed, so that

communication and information communication can bring a real or significant increase in knowledge (Azizaah et al., 2015). This is in line with research conducted by Fernalia (2021), who found that Health counseling using audio-visual media influences public knowledge about flood disaster preparedness in Tanjung Village, Hampan District, Jambi Province. Audiovisual media is considered adequate because in the context of health education related to the provision of disaster information, respondents seem enthusiastic and interested in counseling and pay attention to the videos shown by researchers (Fernalia, 2021). Another study by Rudiyanto in 2021 showed that the level of knowledge before and after the treatment of audiovisual media in the form of an animated video simulating a tsunami disaster has increased by a difference of 14.4 (Rudiyanto et al., 2021). This is to the theory from Saparwati (2020) which states that after providing information related to disaster management using audiovisual media, there is an increase in knowledge about disaster preparedness (Saparwati, 2020).

Health education or counseling will be more effective by using different media to convey information. Learning media can support teaching and learning activities (Kustandi and Sujipto, 2011 in Moro, 2019).

The higher the output produced, the better the preparedness knowledge. Istiroha (2020) said audiovisual media is one of the learning media that can depict moving objects with sound simultaneously. This media contains learning messages regarding concepts, principles, ideas, procedures and applications regarding disasters that aim to increase disaster preparedness. The desired output is that losses due to future disasters can be minimized (Istiroha, 2020). Hamdi explains that learning using audiovisual media is better and more effective than learning with other media (Hamdi, 2016).

5. CONCLUSION

The characteristics of the respondents in this study were grade 5 students at SDN 01 Kemiri, namely the majority of respondents were 11 years old (55%), and also the female sex was the most numerous, namely 12 people (60%). Students' knowledge of flood disaster preparedness before health education (pre-test) resulted in the most detail in the ready. Almost ready class, namely seven students (35%), while the unprepared class consisted of 6 students (30%). Student data on flood disaster preparation after health training in the category of very ready data as many as five people (25%), at least

five people ready (25%) and almost ready as many as eight people (40%).

There are differences in disaster preparedness information before and after health counseling, 18 out of 20 (90%) experienced an increase in knowledge after treatment compared to only 14 people. And almost the entire class of 20 people (70%). This is shown by the Wilcoxon Signed Rank statistical test which obtained a p-value of 0.032 ($p < 0.05$), indicating that health education influences attitudes and knowledge about flood preparedness through audiovisual media. 5th-grade students at SDN 01 Kemiri.

6. ACKNOWLEDGMENTS

The researcher would like to thank all parties who were present and participated in this research, including grade 5 students at SDN 01 Kemiri for the 2020/2021 academic year who were willing to work together as respondents so that this research could be carried out correctly.

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