PROFESIONAL HEALTH JOURNAL
Volume 6, No. 1, December 2024 (Page. 273-280)
Available Online at https://www.ojsstikesbanyuwangi.com/index.php/PHJ/index
E-ISSN 2715-6249
DOI: https://doi.org/10.54832/phj.v6i1.786

The Effect of Earthquake Simulation Animation Videos on The Knowledge And Skills of Earthquake Disaster Preparedness in The 5th-Grade Elementary School Klatak Banyuwangi 2023

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ARTICLE INFORMATION

Article history
Received (29 May 2024)
Revised (1 July 2024)
Accepted (5 July 2024)

Keywords
Animation Video, Disaster Preparedness, Earthquake, Knowledge and Skills

ABSTRACT

Introduction: *Disaster preparedness involves preparing a counter-disaster plan, warning of the disaster, and maintaining resources needed during and after a disaster. The media that can be used by using animated videos can increase knowledge and skills more easily and interestingly for elementary school students.*
Objectives: *This study aimed to investigate the effect of earthquake simulation animation videos on the knowledge and skills of earthquake disaster preparedness in the 5th-grade Elementary School Klatak Banyuwangi.*
Methods: *This study used a pre-experimental research plan with a one-group pre-test post-test research design of 56 respondents with a total sampling technique. Then, statistical analysis was done using the Wilcoxon Signed Rank Test from SPSS 16.*
Results: *Before being given an animated video, they had a knowledge level of scores, most of them as much as 41% in the category of unprepared, mostly 62.5% competent enough for skills. After being given an animated video, knowledge increased to 64.3% with ready criteria, and skills increased to 82.1% with very competent criteria. With a significance value of p=0.000<0.05, there was a significant Effect of Earthquake Simulation Animation Videos on the Knowledge and Skills of Earthquake Disaster Preparedness in 5th grade elementary School Klatak Banyuwangi 2023.*
Conclusions: *Applying knowledge and skills in earthquake disaster preparedness can be done early, starting from elementary school, one of which is by using animated video media, which is expected to be more easily understood, interesting, and can be applied in everyday life.*

Introduction

Indonesia's geographical location traversed by three tectonic plates in the world, namely, the Eurasian Pacific plate and the Australian plate, has resulted in Indonesia being one of the countries with high potential for earthquake disasters, tsunamis, volcanic eruptions, and land movements. The tectonic activity caused volcanoes along the islands of Sumatra, Java Bali-Nusa Tenggara, north Sulawesi-Maluku, and Papua (Maizar et al., 2021). This phenomenon can impact the area traversed so that the intensity of natural disasters increases, such as earthquakes and volcanic eruptions (Abbas et al., 2022). Disaster preparedness is one stage of broader activities known as disaster management. Disaster management steps are preparedness, response, recovery, assessment, prevention, and mitigation (Kurniawati & Suwito, 2019). Disaster preparedness involves the preparation of a counter-disaster plan, forecasting and warning of the disaster, and maintenance of resources needed During and after a disaster, and training of the related personnel, Earthquake disaster preparedness should be implemented, especially for

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children, because they are the most at risk for the negative effects of disaster. Children are psychologically vulnerable and may develop post-traumatic stress disorder or related symptoms. They are physically susceptible to death, injury, illness, and abuse (Winarni et al., 2021).

The Banyuwangi region is prone to earthquakes because it is close to the megathrust zone (the meeting of the Indo-Australian and Eurasian plates) and the back-arc. The arrangement of the plates in the Banyuwangi area is adjacent to the trajectory of the earthquake path, namely the megathrust zone (the meeting of the Indo-Australian and Eurasian plates) in the Indian Ocean, which is south of Banyuwangi. Banyuwangi has the longest coastline in East Java, around 175 km. Therefore, Banyuwangi has the potential to be shaken by a large earthquake accompanied by a tsunami (Ghofur et al., 2022). Based on a preliminary study conducted by researchers on November 17, 2022, with 66 students in 5th grade 5th of elementary school Klatak Banyuwangi, it was found that 100% of students had never received earthquake preparedness materials and training. Some students said that they remembered feeling an earthquake when they were in grade 3 of elementary school. Disaster preparedness education can be carried out early on through a school disaster preparedness program so students can know how to save themselves when a disaster occurs. Several ways or media can be presented tomsupport information about disaster preparedness, including learning media in the form of books, direct field simulations, power points, videos, and animated videos (Pranajati, 2022). Through animated video, media can make it easier to understand the subject matter.

So, this animated video media is an audio-visual media that combines animated images that have been selected and then made to move according to the time count, and the appropriate audio is added. This animated video has many benefits, including it can be used by teachers to shorten the time in delivering material to students. It can minimize errors during live demonstrations in front of the class. It can attract more students' attention and interest because the media display is made attractive and can be utilized by the teacher to present authentic problems in increasing the effectiveness of the teaching and learning process. The teacher can arrange the appearance of the animated video according to his wishes (Mahmudah & Fauzia, 2022). Animated videos are a relevant medium for developing disaster preparedness knowledge and skills. Animation can provide a learning experience and greater interest than reading textbooks or power points because the material presented is audio-visual and movement, so that it can give an impressive impression to the audience. Video is very effective for elementary school students still in the concrete operational stage (Parlindungan et al., 2020). Developing earthquake preparedness knowledge and skills is by displaying a simulation animation video that contains earthquake preparedness both pre-disaster, during a disaster, and post-disaster.

It is necessary to research "The Effect of Earthquake Simulation Animation Videos on the Knowledge and Skills of Earthquake Disaster Preparedness in 5th Grade Elementary School Klatak Banyuwangi 2023". To reduce the risk of earthquake disasters and the limitations of schools in implementing them. The objectives of this study is to determine the effect of earthquake disaster simulation animated videos on the knowledge and skills of earthquake disaster preparedness for 5th-grade elementary school Klatak Banyuwangi 2023.

Methods

This research design used a pre-experimental design with one group pre and post-test design. The design is choosen to compare conditions before and after being given treatment so that the treatment results could be known more accurately. The sample in this study, 56 respondents, were 5th-grade students at Klatak Banyuwangi Elementary School who had never received material on preparedness knowledge and skills. The sampling technique used is total sampling because the total population is less than 100. This study was conducted on August

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2023 at Klatak Banyuwangi Elementary School. In this research, the inclusion criteria are that all 5th-grade elementary school students at Klatak Elementary School had never received material on disaster preparedness. And the exclusion criteria are students unwilling to be respondents and students who did not attend school due to permission or illness. The statistical test by the researcher will use Wilcoxon signed ranks using SPSS 16 for Windows.

The instrument used in this research is the independent variable using a simulation animation video, while the dependent variable uses the LIPI UNESCO disaster preparedness questionnaire. This research questionnaire uses a checklist regarding knowledge, skills and actions on earthquake disaster preparedness, the questions contained the concept of disaster, types of disaster, disaster preparedness, ways of self-rescue, and experience of disaster preparedness activities at school, as well as techniques for helping them. And the animation video shows about earthquake preparedness in the form of moving and simple images that are easy for elementary school students to understand. The animated video entitled SIGEBU "SIaga GEmpa BUmi" with a duration of approximately 04.33 minutes, discusses the definition of earthquakes, types of earthquakes, the consequences of earthquake disasters and how to increase preparedness before, during a disaster, and after an earthquake for elementary school students.

Results

Research data can be presented using a table with the results of univariate and bivariate analysis.

1. Univariate analysis

1.1 Age

Table 1 Distribution of respondents based on the age at 5th grade elementary school Klatak Banyuwangi 2023

Indicator	Frequency	%
11 years old	19	33.9
12 years old	33	58.9
13 years old	4	7.1
Total	**56**	**100.0**

Based on the stage of age development, most of the respondents in this study 58% of them are 12 years old.

1.2 Gender

Table 2 Distribution of respondents based on gender at 5th grade elementary school Klatak Banyuwangi 2023

Indicator	Frequency	%
Female	26	46.6
Male	30	53.4
Total	**56**	**100.0**

The analysis showed that as many as 30 (53.4%) respondents were male.

1.3 Material

Table 3 Distribution of respondents based on the materials at 5th grade elementary school Klatak Banyuwangi 2023

Indicator	Frequency	%
No	56	100.0
Yes	0	0
Total	**56**	**100.0**

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The analysis found that as many as 56 (100%) students have never received material on earthquake disaster preparedness.

2. Bivariate analysis

1.1 Distribution of knowledge results before showing an earthquake disaster preparedness simulation animation video

Table 4 Distribution of respondents based on the result of knowledge before showing an earthquake disaster preparedness simulation animation video

Indicator (Pre-Test)	Frequency	%
Very ready	0	0
Ready	12	21.4
Almost ready	21	37.5
Unprepared	20	35.7
Not ready	3	5.4
Total	**56**	**100.0**

The analysis found that almost half as much as 21 (37.5%) were almost ready in knowledge of earthquake preparedness.

1.2 Distribution of knowledge results after showing an earthquake disaster preparedness simulation animation video

Table 5 Distribution of respondents based on the result of knowledge after showing an earthquake disaster preparedness simulation animation video

Indicator (Post-Test)	Frequency	%
Very ready	12	21.4
Ready	36	64.3
Almost ready	7	12.5
Unprepared	1	1.8
Not ready	0	0
Total	**56**	**100.0**

The analysis found that most of them, as much as 36 (64.3%), were ready for knowledge of earthquake disaster preparedness.

1.3 Distribution of skills results before showing an earthquake disaster preparedness simulation animation video

Table 6 Distribution of respondents based on the result of skills before showing an earthquake disaster preparedness simulation animation video

Indicator (Pre-Test)	Frequency	%
Incompetent	21	37.5
Competent enough	35	62.5
Competent	0	0
Very competent	0	0
Total	**56**	**100.0**

From the analysis, it was found that most of them, as much as 35 (62.5%), were competent enough to be skilled in earthquake disaster preparedness.

1.4 Distribution of skills results after showing an earthquake disaster preparedness simulation animation video

Table 7 Distribution of respondents based on the result of skills after showing an earthquake disaster preparedness simulation animation video

Indicator	Frequency	%

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(Post-Test)		
Incompetent	0	0
Competent enough	1	1.8
Competent	9	16.1
Very competent	46	82.1
Total	**56**	**100.0**

The analysis found that almost all respondents, as much as 46 (82.1%), were competent and skilled in earthquake disaster preparedness.

Discussion

1. Knowledge and Skills Before Being Given an Earthquake Simulation Animation Video

Preparedness is a part of the disaster management process. In the current concept of disaster management, increased preparedness is an important element of proactive disaster risk reduction activities before a disaster occurs (LIPI-UNESCO/ISDR, 2006). (Most research on earthquake preparedness focuses on catastrophic natural earthquakes, aiming to minimize deaths from rapid structural degradation while expediting recovery efforts following major seismic events (Halkia & Ludwig, 2022).

The results show that before being given an intervention in the form of an animated video about earthquake preparedness, the respondents had a level of knowledge and skills on earthquake disaster preparedness and were almost ready and competent enough because knowledge about earthquake disaster preparedness had never been given. Therefore, it became a fundamental need to reduce the risks that may be faced in the event of a disaster having a high vulnerability. Apart from that, because there was never any material on disaster preparedness, this elementary school does not have any supporting facilities regarding signs for evacuation directions or gathering point areas, considering that there is a high risk that the elementary school's location is quite close to the sea. Hazard and disaster education for school children have been studied to help mitigate the impact of disasters. Education has been considered one of the most powerful ways to prepare a society to deal with disasters (Shah et al., 2020).

To accept and understand preparedness, for example, how disaster preparedness material with video animation can be included in social science or local content subjects so that it does not reduce the duration of other subjects. In order to receive, understand, and be able to carry out simulations at the elementary school level, teachers and school principals need to be provided with socialization and training activities on disaster preparedness so that they can implement disaster preparedness programs. At the next level, the implementation that can be done for students can be done through existing extracurricular organizations, for example, the youth Red Cross or scouts. The main goal is to increase school disaster preparedness as a component of the education system.

2. Knowledge and Skills After Being Given an Earthquake Simulation Animation Video

Media means intermediary or introduction (Makki & Makki, 2012). In the context of learning, media are all intermediaries whose role is to convey information from teachers to students. As a conduit of information, the media is important in learning. The media will play an optimal role as an introduction to information if the media is media that students like, following learning objectives, following the material to be delivered, and following the method determined by the teacher.

One way that can be done to increase the preparedness of elementary school students is to carry out a plan that is implemented into media in the form of animated videos (Bello-Bravo et al., 2013). It follows the research results conducted by researchers to 56 research respondents by providing treatment in the form of an animated earthquake preparedness video twice. Succeeded in presenting an animated video to increase elementary school students knowledge

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and skills. This earthquake disaster preparedness animation video consists of an understanding of earthquakes, the types of earthquakes, and what must be done before, when, and after an earthquake. Thus, as respondents often see and understand the animated earthquake preparedness videos, they will find it easier and more adaptable if a disaster occurs and can improve preparedness to reduce fatalities.

The results of this study indicate that through animated videos, earthquake preparedness is quite effective in increasing the knowledge and skills of preparedness in elementary school students. These results follow the research hypothesis that before being given the treatment of earthquake preparedness animation videos, it can be categorized as almost ready for the category of knowledge and competent enough in skills, it has increased to the category of ready and very competent.

Animations could provide a pedagogical platform for information and knowledge that could contribute to positive educational inputs and outputs (Bello-Bravo et al., 2013). This is because learning using media in the form of animated videos can generate motivation and interest in student learning. Besides that, animated videos make learning more fun. Especially animated videos can make it easier and faster for students to understand the material presented.

3. The effect of earthquake simulation animation videos on the knowledge and skills of earthquake disaster preparedness in 5th grade elementary school Klatak Banyuwangi 2023

In this study, pre-test and post-test were carried out, which indicates an increase in the value of earthquake disaster preparedness knowledge and skills. It is because students can understand the material's content in the animated video well, actively ask questions about things that are not understood, and are also very interested and enthusiastic in understanding the material. Using animated videos is self-interest for students. Students easily understand the material being taught, as seen from increased interaction, student activity and value at each meeting (Palimbong et al., 2021).

To strengthen this research, several previous researchers (Liu & Elms, 2019) entitled Animating Student Engagement: The Impacts of Cartoon Instructional Videos on Learning Experience. This study investigates the specific avenues through which animated videos affect student learning, as measured by the level of interest, engagement, enjoyment and ease of access experienced by the students Using survey responses from 254 students from two cohorts over different semesters. In addition, we examine the roles of student demographic characteristics, including age and gender, in determining how students utilize the animated instructional videos. Other research (Mahmudah & Fauzia, 2022) also shows the application of a simulation model of learning about earthquake natural disaster mitigation based on video animation to improve student learning outcomes at SD Negeri 3 Semende Darat Ulu after the data was obtained and then analyzed with a significance level of 5% and 1% it was found that it was smaller than ro 0.404 <0.661> 0.515 it can be concluded that there is a significant influence between the application of video-animation-based simulation models in improving student learning outcomes at SD Negeri 3 Semende Darat Ulu.

The researcher found that providing material in the form of an animated video simulating earthquake preparedness can increase disaster preparedness knowledge and skills and help students be more prepared for an earthquake. The benefits can be felt, and students can even teach their peers and their parents how to increase their preparedness for earthquake disasters. Besides that, viewing videos can be accessed easily, anytime and anywhere. This earthquake disaster preparedness simulation animation video contains positive things for respondents because it can help increase their knowledge and skills initially considered trivial and did not under. They become more understanding and can apply after seeing the animated video, so it is safe to watch all circles.

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Conclusion

There is a significant difference in the increase in the value of knowledge and skills before and after displaying an animated video on disaster preparedness with the results of the effect of the earthquake disaster preparedness simulation animation video on the knowledge and skills of earthquake disaster preparedness in 5th-grade Elementary School Klatak Banyuwangi 2023.

Ethics approval and consent to participate

This research has approved by the Health Research Ethics Committee of STIKES Banyuwangi with No: 170/01/KEPK-STIKESBWI/VII/2023

Acknowledgments

The authors would like to thank the head of Elementary school Klatak Banyuwangi who have given time and place during collecting data on this research.

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PROFESIONAL HEALTH JOURNAL
Volume 6, No. 1, December 2024 (Page. 273-280)
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