

## Earthquake Disaster Simulation on Increasing Knowledge and Preparedness Attitudes of Elementary School Students in Padang City

Salsabil Syahputri\*, Tasman, Yosi Suryarinilsih, N. Rachmadanur, Elvia Metti  
Poltekkes Kemenkes Padang, Indonesia  
\*email: salsabilsyahputri05@gmail.com

### Artikel history

Posted, Jun 10<sup>th</sup>, 2024

Reviewed, Sept 26<sup>th</sup>, 2024

Accepted, Nov 25<sup>th</sup>, 2024

Copyright © 2024 Authors



This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

### ABSTRACT

*The earthquake in West Sumatra in 2009 caused 1,195 people to die, where the majority of victims were the elderly and children. The factor that causes the large number of fatalities during earthquake disasters is the lack of knowledge and attitudes of the community and children regarding earthquake disaster management preparedness. This research aims to determine the effect of earthquake simulation on increasing knowledge and attitudes about earthquake disaster preparedness among elementary school students in Padang City. The research method uses Quasi-experimental with One Group Pre test and Post design, the research location is Lubuk Lintah State Elementary School 21. The population is 80 grade 5 elementary school students with 44 samples taken by proportionate random sampling. The data collection technique uses a questionnaire. The earthquake disaster simulation educational intervention was carried out twice in one meeting for 2x120 minutes. Data analysis used the Paired T-dependent test. The research results showed that there was an effect of increasing knowledge and attitudes before and after being given an earthquake simulation to elementary school students with P-value = 0.000. The research conclusions show that earthquake simulations can be used to increase knowledge and attitudes about earthquake disaster preparedness among elementary school students. If earthquake simulation is used as an activity program in schools, it can make students resilient to disasters.*

**Keywords:** Simulation Education; Earthquake; Knowledge, Attitude

### ABSTRAK

Kejadian gempa bumi di Sumatera Barat tahun 2009 menyebabkan 1.195 orang meninggal dunia dimana korban terbanyak adalah orang tua dan anak-anak. Faktor yang menyebabkan banyaknya korban jiwa saat bencana gempa bumi adalah kurangnya pengetahuan dan sikap masyarakat dan anak-anak tentang kesiapsiagaan penanggulangan bencana gempa bumi. Penelitian ini bertujuan mengetahui pengaruh simulasi gempa bumi terhadap peningkatan pengetahuan dan sikap kesiapsiagaan bencana gempa bumi pada murid sekolah dasar di Kota

Padang. Metode penelitian menggunakan *Quasi eksperimental* dengan *One Group Pre test and Post design*, lokasi penelitian di Sekolah Dasar Negeri 21 Lubuk Lintah. Populasi adalah murid sekolah dasar kelas 5 berjumlah 80 orang dengan 44 orang sampel diambil secara *proportionate random sampling*. Teknik pengumpulan data menggunakan kuesioner. Intervensi edukasi simulasi bencana gempa bumi dilakukan dua kali pada satu kali pertemuan selama 2x120 menit. Analisa data menggunakan uji *Paired T-dependen*. Hasil penelitian didapatkan adanya pengaruh peningkatan pengetahuan dan sikap sebelum dan sesudah diberikan simulasi gempa bumi pada murid sekolah dasar dengan *p-value* = 0,000. Simpulan penelitian menunjukkan simulasi gempa bumi dapat digunakan untuk meningkatkan pengetahuan dan sikap tentang kesiapsiagaan bencana gempa bumi kepada murid sekolah dasar. Simulasi gempa bumi jika dijadikan program kegiatan di sekolah dapat menjadikan murid tangguh bencana.

**Kata Kunci** : Edukasi Simulasi; Gempa Bumi; Pengetahuan, Sikap

## INTRODUCTION

Earthquakes are natural disasters in the form of vibrations or shocks that occur on the earth's surface due to the sudden release of energy from within that creates seismic waves. Earthquakes occur every day, although with different magnitudes (Maryana et al., 2021).

From an earth science perspective, Indonesia is geologically located at the confluence of three active tectonic plates, namely the Indo-Australian plate, the Eurasian plate and the Pacific plate. The activity of these three plates creates a series of volcanoes. In this region, there are generally many active faults, making Indonesia prone to earthquakes and volcanic eruptions (BNPB, 2016).

BNPB in the Disaster Risk Index (IRBI) in 2022, said that West Sumatra province has a Disaster Risk Index that ranks 41st out of 514 total districts or cities in Indonesia with a score of 179.03 (high risk class). Based on data from the Regional Disaster Management

Agency (BPBD) in 2019, reported that the 2009 West Sumatra earthquake occurred with a magnitude of 7.6 on the Richter Scale off the coast of West Sumatra at 17:16:10 WIB on September 30, 2009.

BNPB in the Disaster Risk Index (IRBI) year 2022, said Padang City has a Disaster Risk Index which ranks 4th out of 19 total districts or cities in West Sumatra with a score of 179.03 (high risk class). Padang City was one of the cities affected by the earthquake in 2009.

Children are among the vulnerable groups most at risk of being affected by disasters (Government Regulation No. 21, 2008). The vulnerability of children is caused by a lack of understanding of disaster preparedness, which results in the absence of preparedness in the face of disasters. From the data on disaster events in several regions, many victims are school-age children who are in the school area or outside the school area (Indriasari, 2018).

The factor that causes many casualties during an earthquake disaster is the lack of knowledge and attitudes of the community and children about earthquake disaster preparedness. Children who have higher knowledge are expected to be better prepared to face the possibility of disasters, because knowledge and attitudes are the basis of awareness to deal with earthquake disasters. So that children know how to save themselves during an earthquake disaster (Susilowati et al., 2020).

Increasing knowledge and attitudes towards disaster awareness can be done with health education, namely disaster preparedness education. This education can be started in elementary school age children because according to Piaget, at this time is a concrete operational phase. Where school-age children will easily understand and understand if the material conveyed is accompanied by role playing or simulations about earthquake disaster preparedness, so that it can reduce casualties in school-age children (Fitri et al., 2023).

Grade V elementary school is a stage where it reaches the late childhood stage which lasts from the age of 10-12 years. In this period the child reaches the highest objectivity. In this period, children are in a phase with great curiosity. Therefore, simulation education will be very suitable to be given to 10-12

years old because of the ability and curiosity of children (Soetjningsih, 2014).

Simulation is the presentation of learning experiences using mock situations to understand certain concepts, principles or skills. Simulation education is to build mental readiness to avoid panic in the face of earthquake disasters, and to have the ability to carry out actual evacuation and rescue. Simulations are carried out by role-playing or designing activities that are made as similar as possible to the situation when an earthquake occurs. Before conducting the simulation, educational materials were given to simulate earthquake disaster preparedness (N. W. Sari et al, 2014).

The results of research by Stewart and Wan (2007) and Olson et. Al (2010) found that education about earthquake disaster preparedness using simulation can provide better results than not using simulation. Providing information using the role play method as part of a simulation directed at creating actual events, or earthquake events that may appear in the future (Indriasari, 2018).

The results of research (Anisah, 2020) on the Effect of the Disaster Simulation Method on the Preparedness of Students of SMP Negeri 4 Cigeulis Pandeglang Regency in Facing the Threat of Earthquakes. Before being given earthquake disaster simulation

education, a score of 54.33 was obtained, which was in the criteria for being less prepared. Whereas after being given the treatment of the disaster simulation method, the ability to be preparedness increased with a score of 110.59 so that it became a ready category. This shows that the use of disaster simulation methods has an influence on the preparedness of students of SMP Negeri 4 Cigeulis Pandeglang Regency in facing the threat of earthquakes.

The results of research (Fitri et al., 2023) on Knowledge and Preparedness Attitudes of School-Age Children After Being Given Earthquake Simulations. Based on research conducted by researchers on school-age children regarding preparedness attitudes after the simulation of self-rescue during an earthquake, the results showed that almost all respondents had knowledge of preparedness in facing earthquakes in the good category (84.4%), and most of the respondents had a preparedness attitude in facing earthquakes in the positive category (75%).

Based on the description above, the researcher aims to determine the effect of earthquake disaster simulation education on increasing the knowledge and attitude of preparedness of elementary school students in Padang City in facing earthquake disasters.

## **METODE**

The research design used in this study is experimental Quation research with One Group Pretest and Post-test design. This design will test the effect between research variables conducted in one meeting with 2 interventions within 2x120 minutes. Researchers collected data using a knowledge and attitude preparedness questionnaire instrument given to respondents. The questionnaire used is a modification of the LIPI-UNESCO or ISDR (2006) questionnaire and has been tested for validity and reliability. The research has been ethically tested with letter number 871/KEPK.F1/ETIK/2024.

The sampling technique used is Probability Sampling or proportionate random sampling or random technique by taking into account the categories in the population with a population of 80 people using the Slovin formula calculation, a sample of 44 respondents is obtained, where the sample selection for each class is taken by drawing, based on this formula, a sample of each class is obtained in accordance with the inclusion and exclusion criteria. Inclusion criteria: Willing to be a student respondent or fifth grade student at SD N 21 Lubuk Lintah. Respondents follow the entire series of research from start to finish (pre test, education, and post test). Exclusion criteria:

Respondents were sick, permission or alpha when the research took place.

The intervention process begins with filling out the pre-test questionnaire sheet, then providing material in the form of powerpoints about simulation education, followed by providing the first intervention, namely earthquake simulation training by playing roles or role playing with a duration of 120 minutes supervised by researchers and assisted by 4 elnulumelrator.

The second intervention was to review the simulation education material that had been obtained in the previous intervention. Furthermore, providing earthquake simulation training simulating earthquake disasters by means of role play or role play with a duration of 120 minutes supervised by researchers and assisted by 4 enumeators. Ended with filling out the post test which was supervised by the researcher.

## RESULTS AND DISCUSSION

Table 1.1. Characteristics of Respondents by Age and Gender at SDN 21 Lubuk Lintah

No	Respondent Characteristics	f	%
1.	<b>Age</b>		
	10 years old	16	36,4
	11 years old	28	63,6
	<b>Total</b>	<b>44</b>	<b>100</b>
2.	<b>Gender</b>		
	Male	31	70,5
	Female	13	29,5
	<b>Total</b>	<b>44</b>	<b>100</b>

Table 1.1 shows that more than half of the students are 11 years old, namely 28 people

(63.6%). More than half of the students were male as many as 31 people (70.5%).

Table 1.2. Mean Knowledge of Fifth Grade Students Before and After an Educational Intervention on Earthquake Simulation at SDN 21 Lubuk Lintah

Variable	N	Mean	Median	SD	Min - Max	95% CI	Shapiro - Wilk
<b>Knowledge</b>							
<b>Before</b>	44	13,75	14	2,958	7-20	12,85-14,65	0,172

Variable	N	Mean	Median	SD	Min - Max	95% CI	Shapiro - Wilk
<b>Knowledge</b>							
<b>After</b>	44	16,16	16	2,578	11-20	15,38-16,94	0,066

Based on table 1.2, it shows that the average knowledge score before the earthquake disaster simulation education was conducted on grade V students was 13.75 (95% CI: 12.85-14.65), which is believed that the average student knowledge score is between 7-20, with a standard deviation of 2.958. While the average score of knowledge after earthquake disaster simulation education for grade V students was 16.16 (95% CI: 15.38-16.94), which is believed that the

average score of student knowledge is between 11-20, with a standard deviation of 2.578. The Shapiro-Wilk test results showed normal knowledge distribution, where before the intervention (p-value>0.05) and after the intervention (p-value>0.05), as shown in table 1.2.

Table 1.3. Mean Attitudes of Fifth Grade Students Before and After an Educational Intervention on Earthquake Simulationat SDN 21 Lubuk Lintah

Variables	N	Mean	Median	SD	Min - Max	95% CI	Shapiro- Wilk
<b>Attitude</b>							
<b>Before</b>	44	45,59	44	7,033	34-60	43,45-47,73	0,081
<b>After</b>	44	48,16	46,50	6,931	36- 60	46,05-50,27	0,067

Based on table 1.3 shows that the average attitude score before being given earthquake disaster simulation education to grade V students is 45.59 (95% CI: 43.45-47.73) which is believed that the

average student attitude score is between 34-60, with a standard deviation of 7.033. While the average score of attitude after the earthquake disaster simulation education on grade V earthquake students is 46.50 (95% CI: 46.05-50.27) which is

believed that the average score of student attitudes is between 40-60, with a standard deviation of 6.931.

The results of the Shapiro-Wilk test showed a normal distribution of attitudes, where before the intervention (p-

value>0.05) and after the intervention (p-value>0.05), as seen in table 1.3 the increase in the attitude score of the intervention group was greater (difference value = 1.609) while in the control group the average score difference was 0.512.

Table 1.4. The Effect of Earthquake Simulation Educational Intervention in Increasing the Preparedness Knowledge of Students in Grade V at SDN 21 Lubuk Lintah

<b>in Facing an Earthquake Earthquake Disaster</b>							
<b>Variabel</b>	<b>N</b>	<b>Mean</b>		<b>Selisih</b>	<b>SD</b>		<b>P Value</b>
		<b>Pre</b>	<b>Post</b>		<b>Pre</b>	<b>Post</b>	
Pengetahuan	44	13,75	16,16	2,85	2,958	2,957	0,000

Based on table 1.4, the difference in mean knowledge with a confidence level of 95% obtained p value = 0.000 (p < 0.05). This means that there is an influence

between knowledge before and after being given earthquake disaster simulation education.

Table 1.5. The Effect of Earthquake Simulation Educational Intervention in Improving the Preparedness Attitudes of Fifth Grade Students atSDN 21 Lubuk Lintah

<b>in Facing an Earthquake Earthquake Disaster</b>							
<b>Variabel</b>	<b>N</b>	<b>Mean</b>		<b>Selisih</b>	<b>SD</b>		<b>P Value</b>
		<b>Pre</b>	<b>Post</b>		<b>Pre</b>	<b>Post</b>	
Sikap	44	45,59	48,16	2,57	7,033	6,931	0,000

Based on table 1.5, the difference in mean attitude with a confidence level of 95% obtained p value = 0.000 (p < 0.05). This shows that there is an influence between attitudes before and after being given earthquake disaster simulation education.

**DISCUSSION**

The results showed that the average score of respondents' knowledge before the intervention was 13.75 and the average score of knowledge after the intervention was 16.16. Thus, the average difference between before and after the intervention of earthquake disaster simulation education is

2.85. The earthquake disaster simulation education carried out there is a change in the knowledge of respondents.

Changes in knowledge can be seen from the increase in respondents' knowledge scores based on the results of the pre-test and post-test. Each respondent has a different score increase. The pre test consisted of 20 questions. Before the intervention, there were 4 items that were answered incorrectly by the respondents. In the sub general knowledge about earthquakes in question no.07 there were 17 students (38.6%) who answered that they did not know that during an earthquake they should not run through windows or glass. In the emergency response planning sub-question no.13, there were 18 students (40.9%) who answered that they did not know the importance of recording the addresses or important numbers of family and relatives before an earthquake. In the disaster warning sub-question no.16, there were 19 students (43.2%) who answered that they did not know that the school bell can be used as a disaster warning system, which is one of our preparedness in facing disasters. In the disaster warning sub-question no.17, there were 21 students (47.7%) who answered that crowding is a way to get out of class when the school bell rings to signal an earthquake disaster.

After the intervention there was an increase in knowledge. This is because respondents have received additional information which will form an understanding in increasing knowledge. Based on the results of the post test, 33 students (75%) knew that they should not run through windows or glass during an earthquake. In the emergency response planning sub-question no.13, 32 students (72.7%) knew that it was important to record addresses or important numbers of family and relatives before an earthquake.

In the disaster warning sub-section in question no.16, 33 students (75%) knew that the school bell can be made into a disaster warning system, which is one of our preparedness in the face of disasters. And in the sub-disaster warning in question no.17 there are 32 students (72.7%) who know how to get out of class when the school bell rings to signal an earthquake disaster is not to crowd.

The results of a study (Syamila et al., 2023) entitled "Disaster Preparedness School: Increasing Students' Knowledge and Skills in Earthquake Disaster Mitigation Efforts at SDN 1 Panji Lor Situbondo" intervention in the form of education and counseling, election of disaster mitigation ambassadors, and simulation exercises with role playing during an earthquake disaster at school. Research obtained from 27 respondents



before the intervention obtained an average value of knowledge of 57.63. After the intervention the average value of knowledge increased to 70.00. From this study it can be concluded that there is an increase in students' knowledge about earthquake disaster preparedness after receiving interventions in the form of educational activities and counseling on earthquake disaster preparedness.

This is also in line with research conducted by (Fitri et al., 2023) with the title "Knowledge and Attitudes of Preparedness of School-Age Children After Being Given Earthquake Simulations" after being given an earthquake simulation it was found that almost all respondents had knowledge of preparedness in dealing with earthquakes in the good category (84.4%).

The results of other research conducted by (Anisah, 2020) with the title "The Effect of the Disaster Simulation Method on the Preparedness of Students of SMP Negeri 4 Cigeulis Pandeglang Regency in Facing the Threat of Earthquakes". Before being given earthquake disaster simulation education, a score of 54.33 was obtained, which was in the criteria for being less prepared. Meanwhile, after being treated with the disaster simulation method, the ability to be preparedness increased with a score of 110.59 so that it became a ready category.

This reinforces that the simulation method has an effect on increasing the knowledge of understanding of earthquake disasters in school children.

According to Notoatmodjo (2014), knowledge is the result of human sensing, or the result of someone knowing objects through their senses (eyes, nose, ears, and so on). Increasing knowledge to be aware of disaster preparedness can be done by socialization with the aim of educating. This is in line with the activities carried out by BNPB, that disaster awareness socialization is very important to reduce the impact when a disaster occurs (Pahleviannur, 2019).

Based on this, it shows that education with simulation methods can be an effective intervention used in increasing earthquake preparedness for school-age children because it will make it easier to remember and can be directly practiced. This has also been proven by researchers through research that has been conducted that earthquake simulation education is very suitable to be given as a medium of communication, information and education (IEC) for school-age children, in this case given to elementary school students so that they can apply the earthquake disaster preparedness process if an earthquake occurs at any time.

The results showed that the average attitude score of respondents before the intervention was 45.59 and the average attitude score after the intervention was 48.16. Thus, the average difference between before and after the earthquake simulation education intervention is 2.57.

Changes in attitude can be seen from the increase in respondents' attitude scores based on the results of the *pre-test* and *post-test*. Before the intervention in sub-knowledge statement no. 1 "I take shelter under the table if an earthquake occurs during class time", 16 students (36.4%) answered disagree, and in statement no. 2 "I move away from bookshelves or hanging items and objects if an earthquake occurs", 13 students (29.5%) answered disagree.

After the intervention there was an increase in attitude score. This is because respondents have received additional information which will form an understanding in improving attitudes. Based on the results of the *post test*, in sub-knowledge statement no. 1 "I take shelter under the table if an earthquake occurs during class time" 27 students (61.4%) answered strongly agree, and in statement no. 2 "I stay away from bookshelves or hanging items and objects when an earthquake occurs" 21 students (47.7%) answered strongly agree.

The results of research conducted (Indriasari, 2016) with the title "The Effect of Providing the Earthquake Disaster Preparedness Simulation Method on Children's Preparedness in Yogyakarta" The difference in the mean pre and post values is 5.26 which indicates an increase in preparedness attitudes after being given a simulation.

This is also in line with research conducted by Stewart and Wan (2007) and Olson et. Al (2010) found that education about earthquake disaster preparedness using simulation can provide better results than not using simulation. Providing information with the *role play* method as part of a simulation directed at creating actual events, or earthquake events that may appear in the future (Indriasari, 2018).

This is also in line with research conducted by (Khatimah et al., 2015) with the title "The Effect of the Application of the School Watching Simulation Method on Students' Preparedness Attitudes in Facing Earthquake Disasters". Research obtained from 30 respondents before the Campus watching simulation intervention was a very interesting method that was carried out directly into the field to see the actual conditions. The results of the preparedness attitude of students at MIN Blang Mancung increased with the application of the school

watching method can be seen from the difference in the percentage obtained from 90.99% to 96.66% which has been applied to the *school watching* simulation method.

According to (Azwar S, 2013) attitude is a pattern of behavior, anticipatory tendency or readiness, predisposition to be able to adjust in social situations, or simply attitude is a response to social stimuli that have been conditioned.

Some of the factors that are the main causes of many victims and losses during earthquakes are the lack of knowledge of the community and children about disasters, hazards, attitudes, or behaviors that result in a decrease in natural resources, and the lack of community readiness in anticipating these disasters (Susilowati et al., 2020).

Based on this, it shows that educational media such as simulations in the form of *role play* are effective in providing an attitude of earthquake disaster preparedness for children. Simulation education media is used to improve attitudes about earthquake disaster preparedness because it is considered very suitable to be given to children because children will build mental readiness so that they do not easily panic in facing an earthquake disaster, and have the ability to evacuate and rescue the actual attitude towards earthquake disasters

correctly. This is proven through research where simulation education is effectively used to improve the attitudes of school-age children, in this case elementary school students regarding preparedness for earthquake disasters.

The statistical test results obtained a value of  $p = 0.000$  ( $p < 0.05$ ). The results of this statistical test mean that there is an effect of increasing the preparedness knowledge of elementary school students in facing earthquake disasters by using earthquake disaster simulation education.

The results of this study are in line with research conducted by (Yustisia et al., 2019) with the title "The Effect of Simulation Facing Earthquake Disaster on Preparedness of Students of SDN 86 Bengkulu City". Research obtained from 62 respondents before and after a simulation intervention in the form of *role play* obtained an influence on the disaster preparedness of children's simulation methods with a P value of  $< 0.005$ .

The results of other research conducted by (Emami et al., 2015) with the title "The Effect of Preparedness Counseling Facing Earthquake Disasters on Student Knowledge at Muhammadiyah Trisigan Elementary School Murtigading Sanden Bantul". Research obtained from 41 people obtained *paired sample t-test* analysis

showed a p value of  $0.000 < 0.05$ . There is an effect of earthquake disaster preparedness counseling on student knowledge.

Knowledge is the main factor and key to preparedness. The knowledge possessed can usually influence attitudes and concerns to be alert in anticipating disasters. Knowledge and preparedness have a positive relationship direction, meaning that the higher the knowledge, the preparedness behavior will also increase (Susilowati et al., 2020).

Based on this, it shows that earthquake disaster simulation education has an influence in increasing knowledge of earthquake disaster preparedness, as evidenced by the results of bivariate analysis with a value of  $p = 0.000$ . In addition, the use of simulation education can spur student activeness in learning so that the learning process is no longer monotonous in delivering material, but students are fully involved in learning. Educational media simulating earthquake disasters as an intervention to increase knowledge of earthquake disaster preparedness can run in a fun and no longer monotonous way so that the information conveyed can be received by children well.

The statistical test results obtained a value of  $p = 0.000$  ( $p < 0.05$ ). The results of this

statistical test mean that there is an effect of increasing the preparedness attitude of elementary school students in facing earthquake disasters by using earthquake disaster simulation education.

The results of this study are in line with research conducted by (Mukti et al., 2020) with the title "The Effect of Disaster Preparedness Socialization Through Simulation Methods on Increasing Skills in Facing Disasters in Disaster Preparedness Students". Research obtained from 20 respondents obtained analysis obtained  $\rho = 0.007 < \alpha = 0.05$  means that there is an influence of socialization on student skills in dealing with disasters.

The results of other research conducted by (D. Sari et al., 2019) with the title "The Effect of Providing the Si Sigap Method (Simulation of Ready Mitigation) Earthquake on Disaster Preparedness in 5th Grade Students of SDN 161 Sukapura Bandung City". Research obtained from 56 respondents obtained analysis showed an influence with a  $\rho$ -value of  $0.000$ . The conclusion is that there is an effect of providing the Si Sigap method on disaster preparedness in 5th grade students of SDN 161 Sukapura, Bandung City.

Based on this, it shows that earthquake disaster simulation education has an influence in improving the attitude of

earthquake disaster preparedness, as evidenced by the results of bivariate analysis with a value of  $p = 0.000$ . The results obtained from researchers that children are able to adjust the situation during an earthquake disaster, both at the stage, pre, during, and post-disaster through the questions contained in the earthquake disaster simulation education. That way children can apply in behavior by implementing and anticipating if at any time an earthquake disaster occurs.

## CONCLUSION

Based on research that has been conducted on Earthquake Disaster Simulation on Increasing Knowledge and Preparedness Attitudes of Elementary School Students in Padang City, the following results were obtained: The average score of knowledge and attitudes of respondents before being given education on earthquake disaster simulation for knowledge is 13.75 and after being given education on earthquake disaster simulation is 16.16. For the respondent's attitude score before being given earthquake disaster simulation education is 45.59 and after being given earthquake disaster simulation education is 48.16. There is an effect of earthquake simulation education intervention in increasing the knowledge and attitude of preparedness of elementary school students in Padang City in facing earthquake

disasters with the results of the dependent t statistical test obtained  $p$  value = 0.000 ( $p$ -value  $\leq 0.05$ ).

## REFERENCES

- Anisah. (2020). The Effect of the Disaster Simulation Method on the Preparedness of Students of SMP Negeri 4 Cigeulis Pandeglang Regency in Facing the Threat of Earthquakes: *Journal of Geosphere Education*.
- Databoks. (2022). Indonesia is in the top 3 most disaster-prone countries in the world.
- Emami, S. B., Studi, P., and Keperawatan, I. (2015). The Effect of Earthquake Disaster Preparedness Counseling on Students' Knowledge at SD Muhammadiyah Trisigan Murtigading Sanden Bantul.
- Fitri, T. R., Djamil, M., and Muthia, R. (2023). Knowledge and Preparedness Attitudes of School-Age Children After Being Given an Earthquake Simulation.
- Indriasari, F. N. (2018). The Effect of Providing Earthquake Disaster Preparedness Simulation Methods on Children's Preparedness in Yogyakarta: *Soedirman Nursing Journal*.
- Maryana, Dewi, S. C., and Sunaryo, E. Y. (2021). IPE-based disaster management.
- Mukti, P., Winoto, P., and Zahroh, C. (2020). The Effect of Disaster Preparedness Socialization Through Simulation Methods on Increasing Skills in Facing Disasters in Disaster Preparedness Students (Magana).

- National Disaster Management Agency. (2016). *Disasters Risk of Indonesia: International Journal of Disaster Risk Science*.
- Pahleviannur, M. R. (2019). *As an Effort to Increase Student Knowledge*.
- Sari, D., Amalia, I. N., and Pertiwi, D. R. (2019). *The Effect of Providing the Si Sigap Method (Earthquake Ready Mitigation Simulation) on Disaster Preparedness in Grade 5 Students of SDN 161 Sukapura, Bandung City*.
- Sari, N. W., Sulandari, S., and Lituhayu, D. (2014). *Earthquake and Tsunami Mitigation in Padang City: Journal of Public Policy and Management Review*.
- Susilowati, T., Puji Lestari, R. T., and Hermawati, H. (2020). *The Relationship between Earthquake Preparedness Knowledge and Student Attitudes towards Preparedness at SD Negeri 2 Cepokosawit*.
- Syamila, I., Nurika, G., and Ridzkyanto, R. P. (2023). *Disaster Preparedness School: Improving Students' Knowledge and Skills in Earthquake Disaster Mitigation Efforts at SDN 1 Panji*.
- Yustisia, N., Aprilatutini, T., and Utama, T. A. (2019). *The Effect of Simulation on Earthquake Disaster Preparedness of Students of Sdn 86 Bengkulu City*.