

Earthquake Disaster Preparedness Education in Elementary School Students in Majene Regency

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ABSTRAK

Children are one of the vulnerable populations affected by natural disasters, due to their inability to act independently in the event of a disaster. So it takes effort to improve the preparedness of children to face natural disasters. This study aims to analyze the effect of education using simulation methods and picture book on knowledge about disaster preparedness. This research was conducted in SDN 26 Pakkola as an intervention group and SDN 28 Tamo as a control group. The method used is Quasi Experiment with the design of Non-Randomized Pre-test Post-Test Control Group Design. The total sample are 70 samples. Sampling was done in Simple Random Sampling. Data analysis using Wilcoxon Test and Mann-Whitney. The results showed that the average knowledge score experienced an increase, the intervention group (40%) while the control group (27). This study also showed differences in the average score of knowledge of respondents between the intervention and the control group. For pre-test ($p = 0.962$) which means there was no significant difference while in post-test 1 and 2 there are significant differences ($p = 0.001$ and $p = 0,000$). There was the effect of earthquake disaster simulation education and picture book on knowledge ($p = 0,000$). This study concluded that there was an effect of simulation methods and picture books on increasing student knowledge about earthquake preparedness.

INTRODUCTION

Natural disasters are defined as an incident that causes damage, ecological disorders, loss of human life, health damage, healthcare services, disrupting daily life, causing social, economic and political harm (Rij, 2016). One of the natural disasters that swallowed many victims was an earthquake.

At the world level in the last 20 years the earthquake occurred in several

places like an earthquake in Iran in 1990, that killed about 50,000 people. Besides, the earthquake in Bam Iran also killed approximately 26,271 people in 2003, and the earthquake in Pakistan killed about 50,000 people in 2005 (Rij, 2016; Johnson et al., 2014).

In Indonesia also occurred several major earthquakes that occurred in the last decade of earthquakes in Bengkulu in



2000 (7.8 Skala Richter), Aceh in 2004 (9.2 SR), Sumatera-Andaman in 2004 (killing more than 200 thousand people), Nias in 2005 (8.7 SR), Yogyakarta in 2006 (7.6 SR), Pangandaran in 2006 (6.8 SR), Padang (7.6 SR) and Papua in 2009 (7.6 SR). The economic losses that occurred since 2004-2010 varied from US \$39 million to US \$4.7 billion and caused more than 200,000 casualties (BNPB, 2016; Rohadi, 2009).

Kementerian Kesehatan Republik Indonesia stipulated 170 disaster-prone districts, from the list one of the disaster-prone districts is Majene Regency, West Sulawesi (Kemenkes RI, 2016). According to the National Disaster Management Agency (BNPB) in 2013 Majene District also ranks 8 major national disaster risk.

Enarson et al (2007) stated that in many developing countries, children are mostly the population most vulnerable to natural disasters and in a catastrophic event most of the victims are children. Around 175 million children tend to be exposed to natural disasters every year.

The extent of the children's age is victimized by their inability to act independently in the event of a disaster because of their dependence in part or total in adults (Peek, 2008). One of the reasons is the school-age knowledge of the cause of the injury and choosing the wrong action during a disaster (Johnson et al., 2014).

Research conducted by Winarni et al (2018); Wu et al (2015) states that natural disasters can cause a double burden on children, other than can cause physical injury, they also have trauma. Therefore, it is necessary to designed media that

contains material about mitigation and can be used as a supplement in learning to broaden students ' knowledge of disaster mitigation and to have good readiness and independence to respond disaster.

One of the educational media that can be used for disaster mitigation education is picture book. Students at elementary school age tend to be more happy to read if the contents of the book are interesting pictures, even more pleased to read the Illustrated Storybook (Rahmawati, 2016). In addition, it can also involve students directly on what to do when disasters like disaster simulation exercises.

The research of Indriasari (2016) also showed that the granting of simulated earthquake disaster methods has a positive influence with weak categories of earthquake disaster preparedness in children. According to Olson et al (2010), education on disaster preparedness using simulation in the form of games can give better results than those who do not use the simulation.

But in fact, there are still many schools in disaster prone areas that do not develop media and innovative learning models about disaster preparedness. Based on the explanation, the researcher is interested to see the influence of simulation and education with picture books on the knowledge and attitudes of elementary school students in the preparedness of earthquake disaster in Majene regency.

METHOD

Research Design and Location

This research was conducted at SDN 26 Pakkola and SDN 28 Tamo



Majene Regency. The type of research used is Quasi Experiment with Non-Randomized Pre-Test Post-Test Control Group Design. SDN 26 Pakkola As a group of interventions provided education with simulation methods and picture books while SDN 28 Tamo as a control group given picture book education only.

Population and Sample

The population in this study was all active students as students of grade IV, V and VI at SDN 26 Pakkola as many as 114 students and SDN 28 Tamo as many as 109 students. So the total population of the samples was 223 students, each school selected as many as 39 students samples.

Data Collection

Primary data is obtained from selected students as samples with a pre-compiled list of questions (questionnaire) made under the guidelines of disaster preparedness made by BNPB and the Ministry of National Education based on Research objectives and is filled by respondents.

Data Analysis

Data is analyzed by using the IBM SPSS Statistic 22 program. The analysis used are univariate analysis and bivariate analysis (Wilcoxon and Mann-Whitney Test).

RESULTS

The results of the study based on table 1 showed the respondents of the intervention group dominated by women of 28.6%, based on the age of the group was dominated by the age of 10 years at 22.9%, mostly from class IV to as many as 13 students (18.6%), parents' work

most students are entrepreneurs who are as many as 20 students (28.6%), respondents who have been informed about the earthquake preparedness of 33 people (47.1%) Whereas that has never been as many as 2 people (2.9%), and the characteristics based on the information source of preparedness in the intervention group is mostly sourced from teachers in schools that are as much as 22.9%.

In the control group (table 1) is also dominated by women of 34.3%, then dominated by 11-year-old students as much as 20%, most students also come from class IV, that is as many as 16 students (22.9%), the work of parents is also dominated by The self-employed 45.7%, who had been informed about the earthquake preparedness of 19 people (27.1%) and that has never been as much as 16 people (22.9%), while the characteristics based on the information sources in this group most of the information comes from the Meteorological Agency, Climatology and Geophysical (BMKG) that is as much as 18.6%.

Wilcoxon test results in table 2 showed that there was an increase in the mean value of knowledge of earthquake preparedness from pre-test (10.31), post-test 1 (13.86) and post-test 2 (14.80) on the intervention group after the simulation and picture book media. The test result statistic on the intervention group obtained the value $p = 0.000$ ($p < 0.005$) indicates that there is a significant difference in the mean scores of knowledge at the time of the pre-test and post-test 2, so that it can be concluded that there is a simulated earthquake



impact and picture book media against the respondents' knowledge of earthquake preparedness. The Mann-Whitney test results in table 3. That aims to see the difference in the respondent's knowledge score in the intervention

group and the control group indicate that when the pre-test is obtained the value $p = 0,962$ indicating that there is no significant difference in average knowledge score respondents between intervention groups.

Table 1. Distribution group intervention and control groups

Characteristics	Intervention Group		Control Group	
	n	%	n	%
Gender				
Female	20	28.6	24	34.3
Male	15	21.4	11	15.7
Age				
9 years	2	2.9	11	15.7
10 years	16	22.9	5	7.1
11 years	10	14.3	14	20
12 years	7	10	5	7.1
Class				
IV	13	18.6	16	22.9
V	12	17.1	12	17.1
VI	10	14.3	7	10
Parental work				
Civil servant	9	12.9	1	1.4
Honorary officer	4	5.7	1	1.4
Private employee	2	2.9	1	1.4
Entrepreneur	20	28.6	32	45.7
Whether ever get information on earthquake preparedness				
Yes	33	47.1	19	27.1
No	2	2.9	16	22.9
Earthquake Preparedness Information Resources				
Teacher	16	22.9	0	0
TV	6	8.6	6	8.6
BMKG	0	0	13	18.6
Friend	1	1.4	0	0
Family	5	7.1	0	0
Media social	4	5.7	0	0
Other	1	1.4	0	0



Table 2. The knowledge score of respondents to the intervention and control group during pre-test. Post-test 1 and post-test 2

Statistic value	Knowledge score		<i>p-value</i>
	n	Mean	
Intervention group			
Pre-test	35	10.31	
Post-test 1	35	13.86	0.000
Post-test 2	35	14.80	
Control group			
Pre-test	35	10.40	
Post-test 1	35	12.43	0.000
Post-test 2	35	13.20	

Table 3. The difference in the respondent's knowledge score in the intervention and control group during pre-test. Post-test 1 and post-test 2

Knowledge	Statistic value		<i>p-value</i>
	n	Mean	
Pre-test			
Intervention	35	10.31	
Control	35	10.40	0.962
Post-test 1			
Intervention	35	13.86	
Control	0	0.0	0.001
Control	35	12.43	
Post-test 2			
Intervention	35	14.80	
Control	35	13.20	0.000

and control groups. While the statistical test results at post-test 1 $p = 0.001$ and post-test 2 are obtained the value $p = 0,000$ ($p < 0,005$) indicating that there is a significant difference in average

respondent knowledge score between the intervention group and the control group.

DISCUSSION

Based on the results of the study that education with simulation methods and picture book media affects on students' knowledge of earthquake preparedness. This is shown by the increased knowledge of students before and after intervention.

The effect of simulation on knowledge in accordance with the research conducted by Adeyemi (2011) in Nigeria showed that students given simulation games have a higher average knowledge than the giving of brainstorming. The same is pointed out by Lindell et al (2015) and Oral et al (2015) stating that those involved in earthquake hazard exercises have higher knowledge than those not.

Emami (2015) also showed that students' understanding of earthquakes has increased after being given a simulation. Finnis et al (2010) conducting research on the level of knowledge, perception and disaster preparedness applications in the child in Taranaki, New Zealand, showed that there is a significant difference in knowledge score about self-rescue behavior when Disaster between respondents who have been getting disaster education exercises with the ones that have never been.

Terpstra (2011) stated that having experience in the actions of previous disaster preparedness will strengthen the motivation to behave in subsequent disaster preparedness. In addition, personal experience will also result in adaptability in preparedness so that it can know the exact action that will be carried



out in subsequent disasters (Mulilis et al., 1997; Karanci et al., 2005). So that disaster preparedness education can make students know what actions to take before, during and after the earthquake.

Syuaib (2014) also concluded that simulated learning strategies provide opportunities for students to explore and improve their knowledge of natural disasters. Stewards et al (2007) also stated that simulation has a role in disaster management, as it can measure the readiness of a person in the face of disaster.

During the simulation process the children look passionate and enthusiastic to follow simulation activities, this is because the simulation process is fun so that the message conveyed is more easily accepted by students. Bandrova et al (2015) that shows that the presentation of information with simulated training and entertaining games makes children active in education activities. Putra (2014) also shown that when direct practice of disaster mitigation is seen children are so pleased that it can quickly absorb the knowledge delivered, and the children can easily understand what actions are performed if there is a disaster in the future.

The successful education with disaster simulation applied to elementary school children has been proved by the Japanese. According to the Japanese government that education brought to the education sector has not only impacted the school but also has an impact on the whole community. Surveys conducted by Katada et al (2016) show that a disaster simulation exercise that was conducted repeatedly in the event of no disaster has

successfully saved the 3,000 school children who survived the earthquake and the big Tsumani that struck Kamaishi Even from nearly 1,000 victims were only 5 school-age children who died. This suggests that disaster education is crucial to reducing risk caused by disasters.

In addition to the appropriate teaching methods, the success of the educational process is also supported by the teaching media used. The proper use of media enlarges the meaning and function of supporting the effectiveness and efficiency of the educational process. One of the learning media that is suitable for the learning of elementary school students is picture books, because picture books can help develop children's emotions, get fun and stimulate children's imagination (Nurgiyantoro, 2015). Therefore, the knowledge of respondents can increase because the picture book can inspire the students to find out the information contained in the picture book.

CONCLUSION AND SUGGESTION

We conclude that the education of earthquake disaster preparedness with the simulation method and picture book media affects on the level of knowledge of elementary school students in Majene County. A fun simulation method can make education preparedness can be absorbed by the students well as well as the use of picture book media that can stir the students ' imagination about preparedness, hoping that the knowledge gained Students can be used in the face of the next earthquake disaster. Therefore, it is expected that the government to make disaster



preparedness become one of the compulsory curriculum in elementary school, so that information about disaster preparedness can be thoroughly. In addition, the Government should work together with the school and BNPB to conduct an education in earthquake preparedness.



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