

ANALYSIS OF EARTHQUAKE PREPAREDNESS MEASURES IN STUDENTS AT ELEMENTARY SCHOOL, DENPASAR, BALI

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ABSTRACT

Background: In addition to unsuccessful policies to prepare communities for disaster reduction, the high risk of earthquakes and their harmful consequences indicate that more consideration should be given to social factors in this regard. All community shelters are vulnerable to disasters, especially children, so efforts are needed to determine disaster preparedness factors for elementary school students in Denpasar City. This study aimed to analyze earthquake preparedness measures in students at elementary school, Denpasar, Bali.

Subjects and Method: This was a descriptive study conducted at an elementary school in Denpasar from January to September. A sample of 350 elementary school students in Denpasar whose schools have a disaster preparedness school (SSB) program selected by purposive sampling. The inclusion criteria were elementary school students grades 5 and 6 in Denpasar City, who can read fluently and are willing to be research respondents. The exclusion criteria were respondents who refused to be research subjects. The data were collected by 40 questions, where knowledge was 10 items, attitude was 10 items, facilities and infrastructure were 10 items, and IEC was 10 items. The data was analyzed by descriptively.

Results: The preparedness factors of elementary school students in facing earthquake disasters were still low. There were five earthquake preparedness factors for elementary students in Denpasar, namely (1) experience, (2) knowledge, (3) attitude, (4) facilities and (5) infrastructure, and IEC. The dominant knowledge variable of elementary school students is less than 233 (63.7%), the prevalent attitude variable is negative 244 (64%), the prevalent facilities and infrastructure variable are less than 215 (61.4%), and 300 (85.7%) dominant information and education communication.

Conclusion: It is essential to be able to improve these preparedness factors with a variety of continuous education and training for elementary students, and health workers should work together with regional disaster management agency to establish disaster prepared schools in Denpasar City.

Keywords: preparedness factors, students, and earthquake

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BACKGROUND

Indonesia is an area that is traversed by the 3 main plates of the world, namely Australia, Eurasia and the Pacific. The Indonesian National Disaster Management Agency (BNPB) stated several earthquakes in Indonesia had a significant impact, ranging from damage

to infrastructure buildings and casualties and injuries. Several earthquakes in Indonesia that were quite large include the Aceh earthquake on December 26, 2004 with a magnitude of 9.3 SR followed by a tsunami wave, the death toll in this incident is estimated at 220,000 people accompanied by severe

infrastructure damage. The next large earthquake occurred in Jogjakarta on May 26, 2006 with a magnitude of 5.9 SR and was followed by aftershocks that knocked down government buildings, schools, houses, and damaged electrical installations. At the end of 2016, to be precise on December 7, Indonesia was again shaken by an earthquake in Pidie Jaya Aceh, which was measuring 6.5 SR. From this earthquake, it is estimated that at least 104 people died, 857 were injured, and a total of 45,000 residents were displaced (LIPI, 2006) (Disaster, 2010)

The earthquake's impact was comprehensive, ranging from physical, psychological, economic, social problems; it even affects human health. Health problems that can arise after an earthquake can be in the form of physical or psychological problems (Benis et al., 2018). Examples are physical injuries and injuries, including lacerations and contusions, fractures, and crush injuries (Susanti et al., 2014). Psychological problems that are often encountered are psychological distress, depression, anxiety, cognitive impairment and post-traumatic stress. (Disaster, 2010) (Yusniawati et al., 2018)

The Indonesian Institute of Sciences (LIPI) and UNESCO (2017) researched to see the level of disaster preparedness in schools, households, and communities. With 5 school preparedness parameters (knowledge about disasters, policies and guidelines, emergency response plans, disaster warning systems, and resource mobilization) it was found that the level of school preparedness was lower than the community and apparatus (Thornley et al., 2015) (Haifani, 2008). So the effort for disaster preparedness in

schools becomes an influential joint agenda which is the effort and responsibility of school residents and school stakeholders (Hatthakit & Chaowalit, 2011). Research by Lesmana & Purborini (2015) also states that the level of preparedness for disaster preparedness schools (SSB) is still deficient, both in terms of knowledge, attitudes and actions taken by SSB in disaster risk reduction. Therefore, it is necessary to know the preparedness factors of elementary school students against earthquakes, consisting of knowledge, attitudes, infrastructure, and IEC.

SUBJECT AND METHODS

1. Study Design

This was a descriptive study conducted at an elementary school in Denpasar from January to September.

2. Population and Sample

A sample of 350 elementary school students in Denpasar whose schools have a disaster preparedness school (SSB) program selected by purposive sampling. The inclusion criteria were elementary school students grades 5 and 6 in Denpasar City, who can read fluently and are willing to be research respondents. The exclusion criteria were respondents who refused to be research subjects.

3. Study Instruments

The data were collected by 40 questions, where knowledge was 10 items, the attitude was 10 items, facilities and infrastructure were 10 items, and IEC was 10 items.

4. Data Analysis

The data was analyzed by descriptively, namely disaster preparedness factors (knowledge, attitudes, infrastructure and IEC) and student preparedness in disaster prepared schools (SSB).

5. Research Ethics

This study has received ethical approval from the ethics commission of the Institute of Technology and Health (ITEKES) Bali with an ethical number of 04.0050 / KEPITEKES-BALI / VII / 2020

RESULTS

This study is divided into 2, namely, demographic data consisting of age, gender, class, and experience attending disaster management training in Denpasar City.

Table 1. Demographic Characteristics (n = 350)

Category	N	Percentage (%)
Age		
10 years	214	61.1
11 years	132	37.7
12 years	4	1.1
Gender		
Male	156	44.6
Female	194	55.4
Experience		
None	205	58.6
1x	96	27.4
> 1x	49	14.0

From the data above, the dominant age is 214 (61.1%), with the female gender being 194 (55.4%), and the dominant student who has no previous earthquake disaster training experience is 205 (58.6%).

Table 2. Descriptive Results of Preparedness Factors of Elementary School Students (N = 350)

Variable	Mean	SD	Median	Min-Max
Knowledge	58.2	23.6	50	0-100
Attitudes	60.8	23.1	52.5	25-100
Infrastructure	60.05	25.7	53.8	0-100
IEC	48.7	13.4	45	25-100

Table 3. Demographic Characteristics (n = 350)

Category	N	%
Knowledge		
Good	127	36.3
Less	223	63.7
Attitude		
Positive	126	36
Negative	224	64
Infrastructure		
Good	135	38.6
Poor	215	61.4
IEC		
Ready	50	14.3
Less Ready	300	85.7

The results of the knowledge variable obtained by the students did not understand the earthquake disaster as many as 223 (63.7%), so the dominant attitude was 224 (64%), also supported

with insufficient infrastructure, 215 (61.4%) and Communication, Information and Education (IEC) were also predominantly less prepared, amounting to 300 (85.7%).

Table 4. Descriptive Data of Earthquake Disaster Preparedness Factors for Elementary School Students (N = 350)

No	Statement of	Answers			
		STS F (%)	TS F (%)	S F (%)	ST F (%)
Elementary School Students' Knowledge of Earthquake Disasters					
1	An earthquake is an event of shaking of the earth caused by collisions between earth plates, the activity of faults (faults), volcanic activity, or rock debris.	28 (8.0)	0	0	322 (92.0)
2	The causes of an earthquake are tectonic plate faults and landslides	58 (16.6)	0	0	292 (83.4)
3	When an earthquake occurs, a Tsunami will always occur	129 (36.9)	0	0	221 (63.1)
4	Signs of an earthquake, namely the sound of a roar	186 (53.1)	0	0	164 (46.9)
5	The impact after the earthquake, namely casualties and damage to all facilities	154 (44.0)	0	0	196 (56.0)
6	If any warning of a tsunami disaster during the learning process, which is carried out, namely running to a higher place (Shalter)	220 (62.9)	0	0	130 (37.1)
7	Areas that are at high risk of the threat of an earthquake are areas through which tectonic plates	209 (59.7)	0	0	141 (40.3)
8	When there is an earthquake warning, and it is recommended to save yourself, the equipment brought is your favourite item	167 (47.7)	0	0	183 (52.3)
9	The benefits of an earthquake warning system are as a sign that a tsunami will occur and immediately evacuate to a high place	216 (61.7)	0	0	134 (38.3)
10	The purpose of earthquake disaster preparedness implemented in schools is to increase knowledge about disasters and increase readiness in dealing with earthquake disasters that result in tsunamis.	90 (25.7)	0	0	260 (74.3)

Elementary School Students' Attitudes About Disasters Earthquake

11	There is no need to make preparedness efforts in the face of an Earthquake disaster because there is already a Regional Disaster Management Agency (BPBD) that will handle it	188 (53.7)	99 (28.3)	46 (46)	17 (4.9)
12	Every student should already have a box First aid kit and bring food and drinks as anticipation if at any time a tsunami occurs	180 (51.4)	102 (29.1)	44 (12.6)	24 (6.9)
13	Earthquake disaster training and simulations need to be carried out regularly because it is not enough with the lessons given by teachers in class	40 (11.4)	180 (51.4)	53 (15.1)	77 (22.0)
14	If the Earthquake disaster warning system has been announced, you must remain calm, do not panic, and follow the school principal or teacher's direction. u	141 (40.3)	109 (31.1)	56 (16.0)	44 (12.6)
15	If there is an Earthquake warning, the student must run to the shore to see a shrinkage of sea level	205 (58.6)	44 (12.6)	94 (26.9)	7 (2.0)
16	To reduce the risk of Earthquake disasters, schools must maintain all infrastructure, especially infrastructure related to disaster preparedness	15 (4.3)	79 (22.6)	80 (22.9)	176 (50.3)
17	Before any further orders from the school to save themselves, then stay at the gathering point	182 (52.0)	103 (29.4)	40 (11.4)	25 (7.1)
18	There are at least 1 or 2 students who are trained in earthquake risk reduction, such as being able to provide first aid able to calm his friends during a disaster	121 (34.6)	144 (41.1)	44 (12.6)	41 (11.7)
19	Participating in all disaster simulation and training activities held by schools or other parties	251 (71.7)	66 (18.9)	15 (4.3)	18 (5.1)
20	Motivate (encourage) to other students to improve k preparedness by participating in disaster-related training or simulations	211 (60.3)	68 (19.4)	50 (14.3)	21 (6.0)
Owned Facilities and Infrastructure					
21	Schools provide books related to Earthquake disasters and Earthquake disaster preparedness training equipment (+)	139 (39.7)	0	0	211 (60.3)
22	Available teachers and students who are trained in improving earthquake disaster preparedness (+)	97 (27.7)	0	0	253 (72.3)

23	Available disaster warning tools in schools such as kentongan or bell (+)	54 (15.4)	0	0	296 (84.6)
24	School buildings made of light materials to reduce the impact of disaster risk Earthquake (+)	175 (50)	0	0	175 (50)
25	There are gathering points (safe places) to save yourself from threats Earthquake disaster (+)	86 (24.6)	0	0	264 (75.4)
26	There is a first aid kit needed at school in the event of an earthquake at school (+)	19 (5.4)	0	0	331 (94.6)
27	Earthquake disaster evacuation routes are available needed as a guide in saving oneself (+)	83 (23.7)	0	0	267 (76.3)
28	There is a map of areas at risk from an Earthquake in school preparedness (+)	211 (60.3)	0	0	139 (39.7)
29	There is a special place to conduct Earthquake disaster simulation or training (+)	167 (47.7)	0	0	183 (52.3)
30	The availability of pamphlets, leaflets, brochures about the earthquake disaster in schools	204 (58.3)	0	0	146 (41.7)
Communication, Information and Education					
31	Do younger siblings receive regular Earthquake disaster training conducted by the school or the Regional Disaster Management Agency (BPBD) to school?	191 (54.6)	97 (27.7)	49 (14.0)	13 (3.7)
32	Did your younger siblings participate in the school's earthquake disaster simulations or from the Regional Disaster Management Agency (BPBD)?	185 (52.9)	99 (28.3)	44 (12.6)	22 (6.3)
33	Are younger siblings taught how to save themselves when an earthquake occurs?	40 (11.4)	187 (53.4)	55 (15.7)	68 (19.4)
34	Are lessons about disasters taught to younger siblings by teachers who have been trained/received training on disasters?	145 (41.4)	108 (30.9)	59 (16.9)	38 (10.9)
35	Are simulations conducted at your younger school regularly or routinely?	209 (59.7)	42 (12.0)	94 (26.9)	5 (1.4)
36	Did your siblings get information related to the earthquake disaster through TV, radio, and newspapers?	16 (4.6)	78 (22.3)	80 (22.9)	176 (50.3)
37	Have you ever shown a video or film about the Earthquake disaster in class?	179 (51.1)	105 (30)	41 (11.7)	25 (7.1)

38	Have you ever socialized (notified) areas at risk of an Earthquake?	119 (34.0)	154 (44.0)	42 (12.0)	35 (10.0)
39	Did the school put up an evacuation route map or a notice board regarding the school environment's Earthquake disaster?	252 (72)	62 (17.7)	19 (5.4)	17 (5.1)
40	Do teachers in schools explicitly teach the material (lesson) about the Earthquake disaster	215 (61.4)	64 (18.3)	53 (15.1)	18 (5.1)

Information: STS: Strongly Disagree, TS: Disagree, S: Agree, ST: Strongly Agree

DISCUSSION

Variable Poor knowledge of respondents will be related to a person's low level of preparedness in facing disasters, and common knowledge can lead to low readiness (Davis and Izadkhah, 2008). Low learning can be affected by a bad experience in dealing with disasters. In this regard, it can be seen that almost all SSB students (58.6%) do not have disaster-related training experience. At the same time, knowledge management has an essential role in ensuring the availability and accessibility of accurate and reliable disaster-related information when needed with useful learning lessons such as training and simulations (Yusniawati et al., 2018) (Wedawatta et al., 2016).

Attitude variables also have a significant influence on a person's readiness in facing disasters, but what needs to be remembered in the results of this analysis is that positive or negative attitudes have confounding factors that can influence a person to behave, such as previous experience, education level, region and knowledge of disasters (Agustini et al., 2009) (Disaster, 2010).

The lack of facilities and infrastructure is the biggest obstacle to the preparedness of SSB students. The school has few facilities, such as the inability to provide students with disaster-related reading books, maps of disaster-prone areas, radio

communication facilities, evacuation orders, the school's EWS system, and the school's buildings are still built of fatty materials (Disaster, 2010) (Fathoni, 2018).

IEC received by students in schools is limited to disaster-related subject matter that is transmitted via the lecture method; the school does not innovate in delivering IEC, such as seminars, visits from qualified parties in disasters to schools, disaster drills, and laboratory-based events, so this is an essential factor in enhancing elementary students' preparedness for earthquakes (Hatthakit and Chaowalit, 2011) (Thornley et al., 2015). From the research results above, it was found that the knowledge of elementary school students was still lacking, so that the attitudes of elementary students towards earthquake disasters were negative, supported by an existing infrastructure that was also still incomplete and the IEC provided was still lacking. In collaboration with BPBD, health workers need to regularly carry out counselling and earthquake disaster preparedness training to increase earthquake disaster preparedness factors in students, hopefully improving preparedness and reducing disaster victims.

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