Knowledge level of earthquake and tsunami disaster at disaster preparedness school and non-disaster preparedness school in Kuta Raja sub-district of Banda Aceh

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Abstract. Banda Aceh is one of the worst affected areas in the earthquake and tsunami on 26 December 2004, which claimed more than 75% of casualties and also flattened almost all the buildings in this region. After the Tsunami disaster, various international and local agencies, as well as the government, together with tried to rebuild the affected areas including Banda Aceh. The Tsunami and Disaster Mitigation Research Center (TDMRC) of Syiah Kuala University has begun to build Disaster Preparedness School (SSB) the program that directly touching the main stakeholders in creating disaster-resistant communities. Kuta Raja which is one of the sub-districts in Banda Aceh that is also vulnerable to earthquake and tsunami disaster so it becomes one of the focus in Disaster Preparedness School program. This research was conducted to know what level of Earthquake disaster knowledge and Tsunami in Disaster Preparedness School and Non-Disaster Preparedness School students in Kuta Raja Sub-district of Banda Aceh. The population in this study amounted to 4 elementary schools (2 SSB and 2 non-SSB). Because the population is above 100, the sample is taken 20% from 196, so the total is 40 students for SSB School and 40 students for Non-SSB School. To achieve the research objectives, the method used is a descriptive method with data collection questionnaire technique. Data analysis technique used is calculated as the percentage by using a simple statistic formula. The results showed that the number of students of the Disaster Preparedness School (SSB) responded to the questionnaire with the correct answer percentage of 46.3% (less), while the Non-SSB students had the correct answer percentage of 66.3% (enough).

Keywords: knowledge level, earthquake, tsunami, school disaster preparedness

1. Introduction

The territory of Indonesia has geographical, geological, hydrological and demographic conditions that allow disasters to occur, both caused by natural factors, non-natural factors, and human factors. A natural disaster occurs when an extreme geological, meteorological, or hydrological event exceeds the ability of a community to cope with that event [1]. The disaster can cause human deaths, environmental damage, property losses, and psychological impacts and more complex mental health disorders [2]. Indonesia is a disaster-prone area which is shown by the increasing number of disasters every year. Disasters such as tsunamis, earthquakes, landslides, floods, hurricanes, volcanic eruptions, and industrial accidents are often a serious threat to Indonesian citizens.

Banda Aceh as the Capital of Aceh Province has geographic, hydrological and demographic conditions that are prone to disasters. The mega-tsunami generated by the megathrust earthquake in
the Aceh-Andaman subduction zone (9.2 Mw) in 2004 was the largest tsunami disaster in the 20th Century which caused the death of more than 200,000 people [3]. Banda Aceh was one of the areas worst affected by the earthquake and tsunami on December 26, 2004, which claimed more than 75% of the fatalities and also flattened almost all the buildings in the region and also affected the economic and social life of the people of Banda Aceh. This disaster caused prolonged trauma for the people of Banda Aceh so that it needed a special strategy to anticipate disasters involving the entire community including students at the school.

Education is one of the effective means to reduce disaster risk by incorporating subject matter on natural disasters for every student at all levels, especially in schools in disaster risk areas [4]. Tsunami and Disaster Mitigation Research Center (TDMRC) of Syiah Kuala University has initiated a Disaster Preparedness School (SSB) program. SSB is an activity to build school capacity through strengthening knowledge and attitudes, school policies, emergency response plans, school early warning systems, and resource mobilization based on existing school capacity, especially in anticipating the risk of natural disasters, including earthquakes and tsunamis. Nevertheless, the program to date is still limited to the Disaster Preparedness School (SSB)[5]. In fact, the understanding of anticipating the risk of natural disasters is important for all students in the school. The purpose of this study was to determine the level of Earthquake and Tsunami Disaster Knowledge in School Students of Disaster Preparedness and Non-Disaster Preparedness Schools in Kuta Raja District, Banda Aceh.

2. Methods

The study was conducted in Kuta Raja Subdistrict, Banda Aceh, from December 2016 to January 2017. This study used a descriptive method involving 8 schools consisting of 4 (four) Disaster Preparedness School (SSB) and 4 (four) Non-Disaster Preparedness Schools (Non-SSB) in Kuta Raja Subdistrict, Banda Aceh. The total sample is 40 students for SSB Schools and 40 students for Non-SSB Schools. Interviews are the implementation of the questionnaire verbally and privately with each sample member. This technique is an effort to collect information by submitting a number of written questions to be answered in writing by the respondent. The questions submitted in the questionnaire must lead to the purpose of the research and verification.

2.1 Data Analysis

The percentage level of knowledge is used as a simple statistical formula as follows [6].

\[ P = \frac{F}{N} \times 100\% \]

Where:
- \( P \) = Percentage of knowledge level
- \( F \) = The item frequency is correct
- \( N \) = Total number of questions

| Table.1 Knowledge Level Scale |
|-----------------------------|
| No  | Value Percentage | Category   |
|-----|------------------|------------|
| 1.  | 76-100%          | Good       |
| 2.  | 56-75%           | Enough     |
| 3.  | 40-55%           | Less       |
| 4.  | < 40%            | Not good   |

3. Results And Discussion

3.1 Respondents identity
The number of elementary school students in Kuta Raja sub-district is 5,349 students, with 9,131 male and 7,730 female. However, because this study uses a sampling model, the authors sampled 80 students, namely 40 students from SSB schools and 40 students from non-SSB schools to be respondents in this study. For more details about the sex of students who become respondents can be seen in Table 2 below.

Table 2: The identity of Respondents by Sex at SSB schools

| No | Sex   | Frequency | Percentage (%) |
|----|-------|-----------|----------------|
| 1. | Male  | 20        | 50 %           |
| 2. | Female| 20        | 50 %           |
| Total |       | 40        | 100 %          |

Table 2 above showed that (50%) of the respondents are male and (50%) female. In this study, there was a balance of the number of male and female respondents with status as students attending SDN 17 Banda Aceh and SDN 70 Banda Aceh in Kuta Raja Subdistrict.

Table 3: The identity of Respondents by Sex at Non-SSB schools

| No | Sex   | Frequency | Percentage (%) |
|----|-------|-----------|----------------|
| 1. | Male  | 20        | 50 %           |
| 2. | Female| 20        | 50 %           |
| Total |       | 40        | 100 %          |

Table 3 above showed that (50%) of the respondents are male and (50%) female. In this study, there was a balance between the number of male and female respondents with status as students attending SDN01 Banda Aceh and SDN08 Banda Aceh in Kuta Raja Subdistrict.

3.2 Sources of Disaster Information on Earthquake and Tsunami

Information sources include anything that can be used to help each person to learn and display competencies that can be in the form of messages, people, materials, tools, settings, and techniques. Sources of information are defined as everything and by which someone learns something. In the learning process the components of learning resources may be used singly or in combination, both planned learning resources and learning resources that are utilized. So that it can be said that the source of information is all sources in the form of data, people and certain forms that can be used by students in learning, both separately and in combination so as to facilitate students in achieving learning goals or achieving certain competencies. Information source for earthquake and tsunami disaster for SSB and Non-SSB students are shown in Table 4.

Table 4: Information source for earthquake and tsunami disaster

| No | Source of Information | SSB Students | Percentage (%) | Non-SSB Students |
|----|-----------------------|--------------|----------------|------------------|
| 1. | School                | 60           | 42.5           |                  |
| 2. | Parents               | 30           | 50             |                  |
| 3. | News Paper            | 0            | 5              |                  |
| 4. | Peers                 | 5            | 0              |                  |
| 5. | Social media          | 5            | 2.5            |                  |

Based on Table 3 we know that students obtain information sources for knowledge of Earthquake and Tsunami disasters as much as 60% come from schools, followed by parents, peers, and social media about 30%, 5%, and 5% respectively. This shows that most of the sources of disaster information for SSB students are obtained from school and only a few come from other sources. Meanwhile, 50% of the information sources for earthquake and tsunami disaster were from parents, 42.5% came from school, 5% came from print media, and as much as 2.5% came from social media. This shows that...
half (50%) of all non-SSB school students get sources of information from parents and others get information from other sources.

3.3 The level of students' Earthquake and Tsunami Disaster Knowledge

The concept of knowledge in the context of disaster shows that the success of gaining knowledge lies in the relationship between knowledge management and disaster resilience. Where, the knowledge possessed can motivate someone in taking appropriate actions to save lives [10]. The level of students' Earthquake and Tsunami Disaster Knowledge can be seen in Table 5.

Table 5. The level of students' Earthquake and Tsunami Disaster Knowledge of SSB and Non-SSB students

| No. | School   | Percentage correct answer (%) | Level of students' Knowledge |
|-----|----------|-------------------------------|-------------------------------|
| 1.  | SSB      | 46.3                          | Less                          |
| 2.  | Non-SSB  | 66.3                          | Enough                        |

Based on Table 5 we know that the frequency of correct answers for SSB students is 6.95 with a percentage of 46.3% and the frequency of correct answers for Non-SSB students is 9.95 with a percentage of 66.3%. Thus the level of knowledge of SSB students is in the range of 40-55%, which is classified as less, while the level of knowledge of non-SSB students includes in the range of 56-75%, which is classified as Enough.

Thus it can be analyzed that the SSB program run in schools has not been able to make students have the knowledge of the disaster of the Earthquake and Tsunami in a Good level. Even the results of the study indicate that the level of knowledge of disaster in the Earthquake and Tsunami students are still in the Less. The socialization carried out by TDMRC and the programs run by schools require evaluation, especially school is one of the important stakeholders in increasing students' knowledge.

3.4 Application of disaster alert programs in schools

Tsunami and Disaster Mitigation Research Center (TDMRC) Syiah Kuala University has implemented disaster management programs in schools, especially in Banda Aceh. SSB in Banda Aceh cover all levels of education ranging from elementary schools to high schools, disaster prepared schools are moved to schools located right in Tsunami-prone areas such as Meuraxa District, Kuta Raja District, Baiturrahman District, and other Districts in Tsunami-prone areas. With this program, it is expected that school-aged children in Banda Aceh will gain knowledge about the disaster so that the knowledge gained can be applied and of course the simulation must be carried out continuously. Simulation programs are taught to be more interactive using various methods such as role-playing, discussion, and other methods. Programs invested in schools are included in extracurricular activities. Although there are similar activities related to disaster education held in schools, there are significant differences in how to formally enter curriculum-based disaster themes and include extracurricular-based disaster themes [11].

The results of an interview conducted with the Head of SDN 17 Banda Aceh revealed that SDN 17 Banda Aceh had a disaster alert program. Banda Aceh as one of the disaster-prone areas of the Earthquake and Tsunami should be school-age children to get knowledge about the disaster. In addition, the school has also attempted to bring disaster preparedness values closer together with several activities such as simulations. However, disaster alert programs in schools have not been implemented optimally and are limited to training and socialization activities. He hopes that in the future there will be government involvement in developing disaster alert programs in schools. The results of an interview conducted with a teacher in SDN 70 who was the teacher in charge of the SSB program at the school, he said that the disaster preparedness program was not very running because from the TDMRC also did not convey too much the sustainability of the program that would be
continued by the school. After the socialization and training of students and teachers, the teacher only gave back to students who did not participate in the socialization and simulation [12].

Disaster prevention can be done in schools using local wisdom models from the local community. This will be more effective if carried out sustainably through the curriculum in schools [13]. A local wisdom-based curriculum will explain the relationship between humans and the natural and cultural environment around them [14]. The curriculum for natural disasters is important in disaster-prone countries including Indonesia so students have knowledge about disaster early on [15].

4. Conclusion

The results showed that the number of students of the Disaster Preparedness School (SSB) responded to the questionnaire with the correct answer percentage of 46.3%, while the Non-SSB students had the correct answer percentage of 66.3%. So the level of knowledge of SSB students in Kuta Raja sub-districts is still classified as Less and Non-SSB students' knowledge level that is enough. The SSB program that has not been implemented optimally in schools and the lack of sources of information is a factor causing the students' low knowledge of the earthquake and tsunami disaster.

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