

Students' Tsunami Preparedness Level Comparison in Pangandaran, Indonesia

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ABSTRACT

The spread of schools in disaster-prone areas increases the risk of students' fatalities. Data on the level of preparedness between elementary, junior high and senior high school students is urgently needed to see appropriate approach for improving students' preparedness. This study used descriptive method in which surveys was used as the data collection technique. Data consist of primary and secondary evidence. The data were analyzed using standard depiction of charters, LIPI and UNESCO parameters. The sample consisted of elementary, junior high, and senior high school students in Pangandaran District. Based on the results of t test, it was found that there are significant differences between the level of preparedness of elementary and junior high school students, there are significant differences between the preparedness of elementary and senior high school students, and there is no significant difference between the preparedness of junior and senior high school students. There is a fact that the the Ministry of Education and Culture of Republic of Indonesia and teachers are those contributing to the students' preparedness level.

Keywords: Preparedness, Tsunami, Students

ABSTRAK

Sebaran sekolah di wilayah rawan bencana meningkatkan resiko akan jatuhnya korban peserta didik. Data mengenai perbedaan tingkat kesiapsiagaan antara peserta didik SD, SMP, dan SMA sangat dibutuhkan, untuk melihat pendekatan apa yang nantinya sesuai untuk meningkatkan kesiapsiagaan. Penelitian ini menggunakan metode penelitian deskriptif dengan teknik pengumpulan data berupa survey, data terdiri atas primer dan sekunder. Data dianalisis dengan menggunakan standar penggambaran parameter carter, LIPI dan UNESCO. Sampel terdiri atas peserta didik SD, SMP, dan SMA di Kecamatan Pangandaran. Berdasarkan hasil Uji t bahwa terdapat perbedaan yang berarti antara tingkat kesiapsiagaan peserta didik SD dan SMP, terdapat perbedaan yang berarti antara kesiapsiagaan peserta didik SD dan SMA, dan tidak terdapat perbedaan yang berarti antara kesiapsiagaan peserta didik SMP dan SMA. Terdapat fakta bahwa Dinas Pendidikan dan guru menjadi salah satu penyebab rendahnya tingkat kesiapsiagaan peserta didik.

Keywords: Kesiapsiagaan, Bencana Tsunami, Peserta Didik

INTRODUCTION

Geologically, Indonesia is a confluence of three large plates of the world resulting in very rich natural resources. The logical consequence of

this confluence is geological natural disasters that are ready to threaten at any time. Indonesia has a high level of seismicity as a result of the confluence of the world three major plates; the

Indo-Australian, Eurasian and Pacific plates[1]

The high potential of an earthquake raises fears of another disaster as the domino effect of the earthquake, namely the tsunami. Tsunamis are giant sea waves that suddenly occur due to abrupt disruption of sea water caused by earthquakes, or other factors. [2]. This potential disaster may result in human casualties, injuries, and material losses and damage [3].

Data from the Geological Agency explains that the southern coast of Java is one of the regions that is very high in potential earthquake and tsunami disasters. On July 17, 2006 at 15:19 WIB, an earthquake measuring 6.8 on the Richter scale caused a tsunami as high as 1-3.5 meters on the South Coast of Java causing 500 fatalities[4].

Pangandaran District is one of the areas affected by the disaster. Unquestionably, based on this experience, Pangandaran must pay more attention to mitigation aspects in dealing with disasters that may hit at any time

In Pangandaran, there are schools located near the coastline. Disaster mitigation in the education sector certainly must be taken into account because during school hours, many students are concentrated at school, and they are very at risk of impending disaster.

If a tsunami occurs, a person's survival will be influenced by their preparedness to respond to the situation [5]. Preparedness is anticipatory activities such as planning, resource identification, warning systems, training, risk communication, public awareness and education, and exercises carried out to improve the security and effectiveness of

community responses during disasters [6].

Planning in tsunami preparedness can be done through education aimed at reducing losses from tsunamis [7]. Furthermore, there are three basic educational needs of people and communities in potentially dangerous zones, namely:

- Recognizing the signs of an impending tsunami
- Understanding what areas are at risk
- Knowing how and when to evacuate

Preparedness is defined as actions taken before an emergency to develop operational capabilities and to facilitate effective responses in case of an emergency [8].

The importance of a significant increase in Northern California residents' knowledge of the dangers of the tsunami from 1993 to 2001, with knowledge of what happened to the tsunami increased from 78 to 98% during this period [9].

Research in Washington shows that only a few of the inhabitants of the region actually show that they have awareness of tsunami dangers and most rely on the government agencies action and have limited awareness to play a role in reducing tsunami threats [10].

Knowing the level of preparedness of elementary, junior high and high school students in dealing with disasters is certainly very important. The data will be used as a source of reference in policy making; what policies must be taken to minimize the impact of disasters among students. The goal is clear; to increase the level students' preparedness in dealing with disasters untuk meminimalisir dampak bencana yang terjadi di kalangan para

peserta didik. Tujuannya jelas, yaitu meningkatkan tingkat kesiapsiagaan peserta didik dalam menghadapi bencana.

RESEARCH METHOD

This study used descriptive method to examine a group of people, objects, conditions, thoughts, and also events that occur at this time, which aims to describe the situation systematically, unswervingly, and precisely [11]. Descriptive research method is a way to express an ongoing phenomenon and are sometimes accompanied by interpretation and analysis [12].

A survey method is an investigation to get the facts of a situation, and look for a factual description of social, economic, political groups, obtained from a specific group or region [11].

This survey study collected the data by selecting samples taken from the population, then filling out the questionnaire as the main data collection instrument, with the aim of making direct observations at the research location to formulate what has happened [13]. The determination of the sample is taken proportionally based on the total population per school.

RESULT AND DISCUSSION

Disasters are events or series of events that affect people's lives; either natural, not natural, or caused by humans, threatening humans' live or existence. Disasters are serious disruptions to people's lives and usually result in losses that cannot be overcome by the community's own resources [14]. It is called a disaster if the threat comes and is accompanied by an inability to deal with it [15].

Furthermore, a disaster is an event that disrupts community's normal life, comes suddenly and has a broad impact, and can even cause death [16]. Concrete steps are needed so that the community, learners in particular, are able to minimize the impact of disasters. Therefore, the level of preparedness is very important to disseminate so that they can think about what needs to be done.

Preparedness is an important and effective factor that can save lives, reduce injuries, limit the loss and minimize all kinds of disruptions caused by disasters [17].

The parameters of community preparedness adopted in this study were divided into the following five parameters: knowledge and attitudes, emergency planning, warning systems, resource mobilization, and emergency planning [18].

The five parameters are interpreted into the research instrument using a five scale response [19], to measure the level of preparedness of students. The scale is fully prepared, prepared, less prepared, unprepared, and very unprepared.

Elementary School Students' Preparedness Level

Preparedness is an inseparable part of disaster mitigation. Mitigation is an effort to reduce the impact of threats before they occur [13]. Disaster mitigation must be accompanied by appropriate strategies, based on in-depth disaster risk assessments, and carried out by all elements; government, private organizations, volunteers, and other parties.

Preparedness is set to respond to environmental threats. This results from a process in which the community examines its vulnerability to various

environmental dangers (vulnerability analysis), identifies the human and material resources available to deal with these threats (capability assessment), and defines the organizational structure in which a coordinated response must be made (plan development) [14].

Table 1 Elementary School (SD) Students' Preparedness Level in Responding to Tsunami Threats

No	School	Number of Sampel	Score
1	Elementary School (SD)	43	1821
2	Moslem Elementary School (MI)	6	197
	Jumlah	49	2018
	means / category	41,18 / Fully Prepared	

(Source: Research 2013)

Preparedness is an action that make the government, related parties, or individuals ensure effective prevention, rehabilitation, and recovery, including disaster management planning, maintaining resources and training community members [16].

From the previous explanation, it can be seen the importance students' preparedness in dealing with disasters. The results of the study, the level of preparedness of elementary school students (SD) is presented in table 1.

Junior High School Students' Preparedness Level

Disasters that give a special concern from the international community are those that have a high threat to large populations. Preparedness is a series of processes of disaster management, and is an important element in the process of reducing the impact of disasters [9]. Junior High School (SMP) students' preparedness level is shown in table 2.

Table 2 Junior High School (SMP) Students' Preparedness Level in Responding to Tsunami Threats

No	Schools	Number of Sample	Score
1	Junior High School (SMP)	17	588
2	Islamic Junior High School (MTs)	8	287
	Jumlah	25	875
	Means / category	35,00 / prepared	

(Source: Research 2013)

The average score obtained from junior high school students is 35.00 which is in the prepared category, which is less than the average score of elementary school students in the fully prepared category.

This fact is due to the condition of the students who are in the puberty phase in which they are indifferent to the existing rules and are more concerned with their ego, or lack of awareness about the rules including to their disaster preparedness level. Lack of supporting factors for disaster mitigation infrastructure in schools also worsen the situation.

Almost all Junior High Schools in Pangandaran District do not yet have facilities and infrastructure such as early warning alarms and disaster evacuation routes. There is only one school, in Pangandaran Middle School 2 which has Tsunami Hazard Zone sign.

Senior High School (SMA) Students' Preparedness Level

Disaster preparedness is a series of continuous, active, continuously tested, and continuously improved process.

Over time, the level of disaster preparedness will decline affected by social, cultural, political, and economic changes [18]. Continued efforts to maintain this level of preparedness need

to be considered, especially in the school environment.

The Senior High School (SMA) Students' Preparedness Level is shown in table 3.

Table 3 Senior High School (SMA) Students' Preparedness Level in Responding to Tsunami Threats

No	Schools	The Number of Samples	Scores
1	Senior High School (SMA)	12	411
2	Vocational School (SMK)	12	391
3	Islamic Senior High School (MA)	1	37
Jumlah		25	839
means / category		33,56 / prepared	

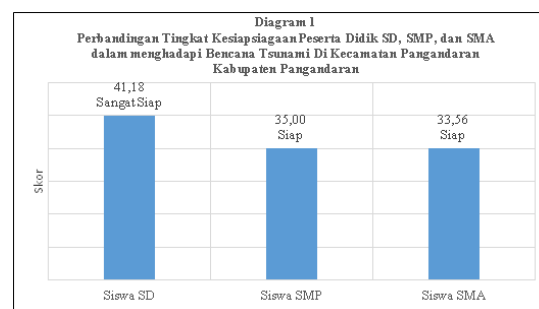
(Source: Research 2013)

The average score for high school (SMA) students is 33.56 which falls into prepared category. The average score is the lowest compared to that of elementary and junior high school students. The low score obtained by high school students is not much different from the reason for junior high school students, namely the lack of awareness on disaster preparedness. For instance, the local government had once held an earthquake and tsunami disaster simulation. The high school students even preferred playing to attending the simulation.

Related to disaster mitigation facilities and infrastructure, SMA has the same problem as elementary and junior high schools that do not yet have warning alarms, and disaster evacuation routes. This is what aggravates the situation in understanding the importance of disaster preparedness.

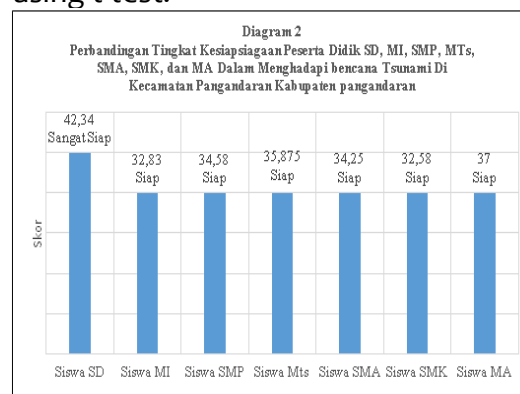
The Comparison of Elementary, Junior and Senior High School Students' Preparedness Levels

The average score obtained by elementary, junior high, and high school students was then compared and presented in Chart 1. In Chart 1, based on the results of the study, elementary school students have the highest average score, followed by junior high school students and students SMA ranks last. In more detail, elementary school level students are divided into elementary school (SD) and Islamic elementary school (MI), junior high schools consist of junior high schools (SMP) and Islamic Junior High School (MTs), and senior high schools consist of Senior high schools (SMA), vocational schools (SMK), and Islamic senior high school (MA).



(Source: Research 2013, with adjustment)

Based on Chart 2, sorted according to the average score of students' preparedness in facing disasters, the first position is SD with the highest score, followed MA, MTs, SMP, SMA, MI, in that order and the lowest is SMK. The comparison of preparedness in dealing with disasters was carried out using t test.



(Source: Research 2013, with adjustment)

The result is that there are significant differences between elementary and junior high school students' preparedness, there are significant differences between elementary and high school students' preparedness, and finally there are no significant differences between junior and senior high school students. This difference certainly will not exist if the planning in disseminating elements of preparedness is carried out by the government properly and appropriately.

The elements that must be considered in enhancing such preparedness are strong policies and regulations, permanent institutions or units, routine identification and study of disasters, emergency planning, and appropriate use of resources [20]. Unquestionably, the aforementioned actions can be done from the lowest levels of local government, RT / RW for instance, to the national and even international scale.

Contributing Factors to Different Preparedness Levels of Elementary, Junior and Senior High School Students

Schools play an important role and contribute to disaster awareness in the community [21]. Disaster mitigation facilities and infrastructure factors in schools are one of the important factors that affect the level of preparedness of students at each level. The existence of early warning alarms, evacuation routes, and disaster hazard banners is rarely found in every observed school.

In fact, of all schools, only in SMPN 2 Pangandaran, the 2006 tsunami disaster banner were found. The second factor is the lack of counseling or even a simulation of the disaster from the school or related institutions, because it obvious that direct practice will improve the students' preparedness. The third

factor is the Social Sciences / Geography Teacher Education backgrounds.

A teacher is a professional educator who has the main task of planning, implementing, and evaluating learning, in early childhood education, formal education, primary, and secondary education.

Elementary school teachers are mostly ordinary classroom teachers who have pintsized knowledge about disaster. Likewise, there are almost no social sciences teachers in junior high school with a Geography Education background. As for the senior high school level, only 20% of geography teachers have linear backgrounds, the rest are not linear. Teacher education will affect the level of teacher understanding of disaster mitigation materials, especially preparedness.

The fourth factor is teaching methods in which most teachers use lecturing method that are considered less innovative, especially in attracting students' attention. The fifth factor is the student's behavior.

Elementary school students who scored the highest are the reflection of obedient behavior.

While junior and senior high school students who get lower average scores in disaster preparedness behaved relatively different so that their level of preparedness was somewhat concerning. It is believed that their behavior may have affected this level of preparedness. Junior and senior high school students who are in their puberty phase are indifferent, have less concerned about the rules taught, prefer playing, play gadgets, and do other less-useful activities.

These various factors can affect the level of preparedness of students in dealing with disasters. As in the case of attitude, the more mature someone is,

the preparedness is supposed to be and the better the results will become.

CONCLUSION

There are significant differences in preparedness level of elementary, junior high and senior high school students in dealing with the tsunami. The highest score is elementary school students, the second place is junior high school students, and the lowest is high school students.

Based on T Test calculation, it was revealed that there are significant differences in students' preparedness level between elementary and junior high school students, there are significant differences in students' preparedness level between elementary and high school students, and there are no significant differences in students' preparedness level between junior and senior high school students.

Factors contributing to the levels of preparedness are lack of disaster mitigation infrastructure, lack of disaster mitigation counseling, teachers' non-linear educational background, monotonous teaching methods, and students' attitudes.

RECOMMENDATION

The government, in this case the Ministry of Education and Culture, should pay more attention to disaster mitigation facilities and infrastructure at schools, conduct more counseling programs and disaster simulations.

For the teachers, the teachers are expected to further increase their knowledge of disaster preparedness in order to better educate their students related to disaster preparedness. Students, control must be further improved, especially in terms of attitude, so that any material delivered

related to disaster preparedness can be properly immersed.

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