

Perception of the Tsunami and Its Correlation with Student Preparedness at Universitas Negeri Padang

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Abstract

Padang State University is located in the tsunami-prone zone. Students as one element at risk need to have good insight into disaster and implement preparedness to face tsunami threat. This research aims to determine the correlation between the perception of the tsunami disaster and student preparedness at Padang State University. The methods used are quantitative with correlational techniques. The correlation technique is used to parse and measure how much the relationship level between variables or data devices is in a group of subjects. The selection of samples on this study was conducted by a cluster sampling technique. Samples on the cluster area are taken from 8 faculties in Padang State University with a minimum amount of 30 samples for each faculty. Risk perception in this research will be measured based on psychometric according to Schmidt, and the preparedness parameters using LIPI – UNESCO/ISDR assessment framework. The result is a significant correlation between the perception of tsunami disaster risk and student preparedness.

Keywords: *perception, preparedness, tsunami*

Introduction

Indonesia and the disaster are two things that seem to be undivided. The natural phenomenon that is commonplace occurs, at first is the danger and will turn into a disaster when there are activities of human life surrounding it Kusumasari (2014). Situation after the disaster has always been a negative implication in all areas. Damage to physical infrastructure, loss of community livelihoods, economic stability is hindered, psychological conditions are also disrupted, the desperate feeling of disaster victims leads to increased depressive numbers and reduced motivation to build Nurhabibi, (2018).

West Sumatera is one of the areas that has a diverse potential disaster including tsunami. West Sumatera Province is located above the subduction zone that can cause a large earthquake covering about 50-230 km from the west coast of Sumatra island, namely from Padang to the sea trench where Sunda megathrust reaches the seabed to West Sumatra region is classified by earthquake tectonic with relatively high intensity that is very potentially generating tsunami waves BPBD Kota Padang, (2013).

Previous experience shows that disasters are often perceived as random events, where reactive responses are only needed when a disaster occurs. While it is difficult to predict the timing and intensity scale of an event appropriately in the future, Governments and communities can undertake a preventive measure that has been proven to have a positive impact on mitigation efforts against possible consequences. To date, disaster management is often only limited to short-term reactive response and less-oriented proactive measures for preparedness and long-term mitigation efforts (LIPI –UNESCO/ISDR, (2006).

The need for preparedness by involving various stakeholders, one of which is that universities are considered to have enormous potential as a source of knowledge, dissemination of knowledge about disasters and what practical instructions must be prepared before a disaster occurs and what must be done during and after a disaster. Of course, it is necessary to prepare quality human resources at the

university level in integrating disaster insight. Students as part of campus intellectual actors have high hopes as a catalyst in disaster management.

This study will measure the extent of students' preparedness for the tsunami disaster by first looking at their perceptions of the disaster itself. The perception of risk will influence behavior in dealing with risk Pan, (2012). Also, perception influences one's level of awareness of risk. Risk perception should be known before carrying out disaster management because risk perception is one of the basic elements that shape people's behavior in dealing with disasters Calvello,(2015). If risk perceptions are known in disaster-prone areas, an effective strategy system for measuring safety can be planned Pan, (2012). Padang State University, in this case as a campus located in the red zone area of the tsunami threat, is expected to be the frontline in implementing preparedness, of course, with a comprehensive understanding of disaster management. This study aims to explore whether there is a correlation between perceptions of the tsunami disaster with student preparedness at Padang State University.

Method

This research was conducted at Padang State University located in the city of Padang, West Sumatra Province. The reason for choosing the location as a place to collect data is because this location fulfills the main conditions required, which are included in the tsunami-prone zone. Padang State University had previously suffered damage and losses both materially and non-materially due to the earthquake that occurred in 2009. As a result of academic activity suffered total paralysis. The sample selection in this study was carried out by a cluster sampling technique. The subjects of this study were students of Padang State University consisting of 8 faculties with a minimum of 30 samples for each faculty, including FIP, FBS, FMIPA, FIS, FT, FIK, FE, and FPP. Subjects consisted of various classes, from the 2017 class until 2019. The total sample collected was 217 samples from 8 faculties.

This research uses quantitative research methods with correlational techniques. The focus of this statistical correlation technique research is on testing the relationship between two or more variables, not on the effect of a particular intervention or treatment. The variables measured in this study are the risk perception variable and the preparedness variable. Perception in this research is measured by using psychometrics according to Schmidt such as Voluntariness, Controllability, Delay Effect, Natural vs. Manmade, Familiarity and Habituation, Benefit and Risk-Benefit Distribution, and The Role Other Media. While preparedness is measured based on the LIPI - UNESCO / ISDR assessment framework including resource mobilization, disaster warning systems, plans for natural disaster emergencies, policies and guidelines related to preparedness to anticipate natural disasters, and knowledge and attitudes towards disaster risk.

Results and Discussion

Risk Perception

Data categorization for risk perception variables is presented in Table 1. below:

Table 1. Categorization of Risk Perception Variable Data

No	Category	Norm	Number of Subjects	Percentage
1	Very Low	$X \leq 61,78$	13	6%
2	Low	$61,78 < X \leq 73,44$	39	17,97%
3	Medium	$73,44 < X \leq 85,1$	94	43,31%
4	High	$85,1 < X \leq 96,76$	64	29,5%
5	Very High	$X > 96,76$	7	3,22%
Total			217	100%

From Table 1 it can be seen that the subjects who had a "very high" risk perception score were 7 subjects or 3.22% of the total research subjects. Subjects classified in the category of "high", which has a score between 85.1 to 96.76 are 64 subjects or 29.5% of the total research subjects. The most subjects were in the medium category, amounting to 94 people or as many as 43.31%. Subjects belonging to the low category numbered 39 people or as many as 17.97% had risk perception scores between 61.78 to 73.44. 6% of research subjects or as many as 13 subjects had very low motivation scores.

Preparedness

The categorization of data for the preparedness variable is presented in the following Table 2:

Table 2. Categorization of Preparedness Variable Data

No	Category	Norm	Number of Subjects	Percentage
1	Very Low	$X \leq 168,79$	16	7,37%
2	Low	$168,79 < X \leq 184,85$	42	19,35%
3	Medium	$184,85 < X \leq 200,91$	93	42,86%
4	High	$200,91 < X \leq 216,97$	51	23,51%
5	Very High	$X > 216,97$	15	6,91%
Total			217	100%

Table 2. above shows that the research subjects have different levels of preparedness. A total of 15 subjects were in the very high category or as much as 6.19% of the total research subjects. Subjects in the high category numbered 51 people or with a percentage of 23.51%. The most subjects were in the medium category with 93 subjects or 42.86% of the total research subjects. While the remaining 42 subjects were in a low category and 16 subjects were in the very low category.

Based on the two results of the data description of risk perception and student preparedness it can be concluded that the majority of subjects are in the moderate category. Before conducting a hypothesis test, the researcher first conducts a normality test to see if there are any deviations in the frequency of research results from hypothetical frequencies. If there are no deviations, the tested variable means it has a normal distribution. The normality test was carried out using Kolmogorov-Smirnov (K-S Z) Two-Sample technique in the SPSS Statistics program. The rule used is if $p > 0.05$ then the distribution is normal, but if $p < 0.05$ then the data distribution is not normal.

Normality test results in two groups of subjects showed K-S value of $Z = 0.753$ with $p = 0.623$ ($p > 0.05$). With this result, it can be concluded that the variables used in this study were stated to be normally distributed (fulfilled). Hypothesis testing is done by Pearson's product-moment correlation technique. The results of the data analysis showed that there was a significant correlation between perceptions of the tsunami disaster with student preparedness with $r = 0.208$ and $p = 0.002$ ($p < 0.01$) at the 1% significance level.

Therefore the hypothesis which states "there is a significant correlation between perceptions of the tsunami disaster and student preparedness" is acceptable. This shows that the higher the perception of disaster, the higher the student preparedness. Conversely, the lower the perception of disaster, the lower the student preparedness.

The results of data analysis with Pearson's product-moment correlation technique showed that there was a significant correlation between the perception of the tsunami disaster and the preparedness of Padang State University students with $r = 0.208$ and $p = 0.002$ ($p < 0.01$) at a significance level of 1%. That is, the higher risk perception is followed by high student preparedness.

This finding is reinforced by research from Miceli, R., Sotgiu, I., & Settanni, (2008) in Italy which also found that there was a significant correlation between risk perception and disaster preparedness. In their study, Miceli, R., Sotgiu, I., & Settanni, (2008) involved 407 adult residents in nine communities. Also, Cliff et al., (2009) research also prove the same results. In a study conducted at a rural hospital in the United States, it was found that risk perception had a significant positive correlation with preparedness variables.

The positive correlation between risk perception and student preparedness is also motivated by their experience of the West Sumatra earthquake disaster in 2009. The experience of disaster and the feeling of loss teaches them to be vigilant, in line with the study of McNeill et al., 2018 which revealed that perceptions of preparedness and disaster experience are very helpful in emergency conditions. Figures 1 and 2 show the respondents' data based on their experience of experiencing disasters and losses.

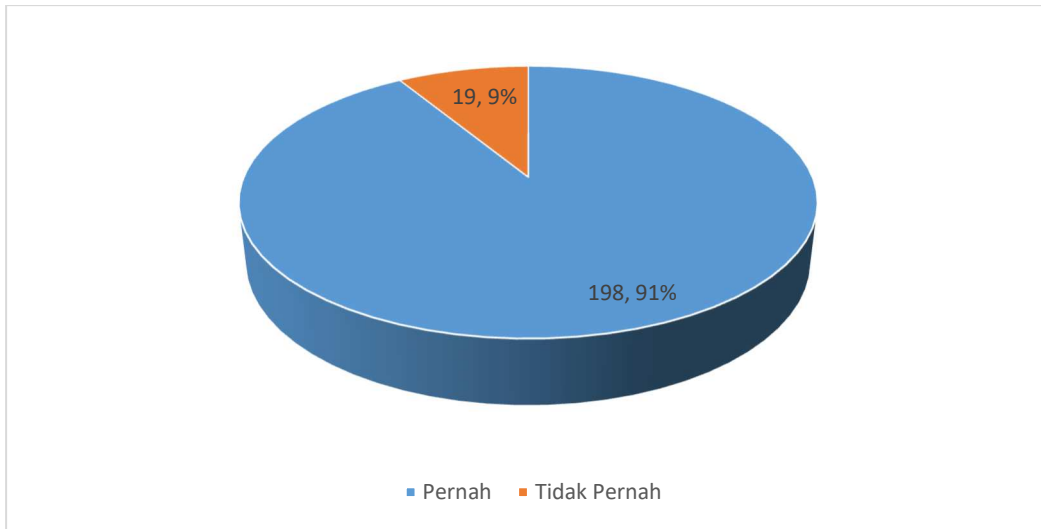


Figure 1. Profile of respondents based on experience experiencing disasters

Very clear inequality can be seen from the experience of feeling a disaster. The diagram above shows the number of respondents who have experienced a disaster as much as 91% while those who have never experienced a disaster are only 9% of the total respondents. This is natural because Padang City is one of the cities with a high level of disaster vulnerability in Indonesia.

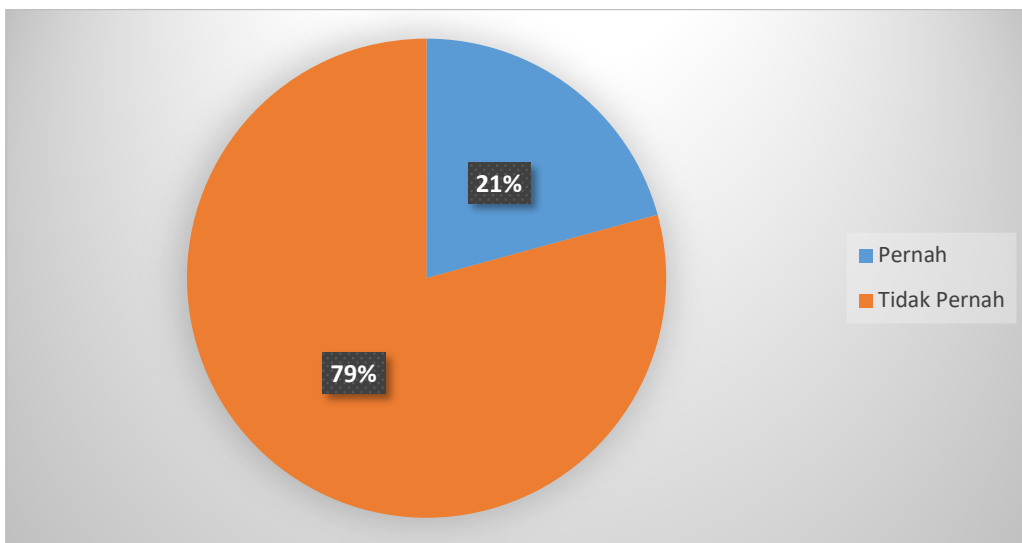


Figure 2. Profile of respondents based on the experience of loss

Figure 2. Shows the profile of the study respondents based on their experience of losing family/relatives / close friends who died from the disaster. The diagram above shows that the group of

respondents who had felt the loss of family/relatives/close friends due to the disaster accounted for only 21% of the total respondents. While those who have never experienced it reaches 79% of the total respondents.

The distance of the respondent's residence to the tsunami zone is considered influential in developing risk perception and preparedness attitude. This is because respondents will feel overshadowed by the threat of disasters that can occur at any time. In line with Xu et al., 2018 that risk perception has a significant relationship with disaster preparedness. Respondents with higher perceptions of unknown probabilities, threats, worries, and fears are more likely to show disaster preparedness and adopt more types of disaster preparedness behavior; respondents with a higher perception of controllability are less likely to show disaster preparedness and adopt fewer types of disaster preparedness behavior. The profile of the distance between the respondent's residence location and the beach can be seen in Figure 3. below:

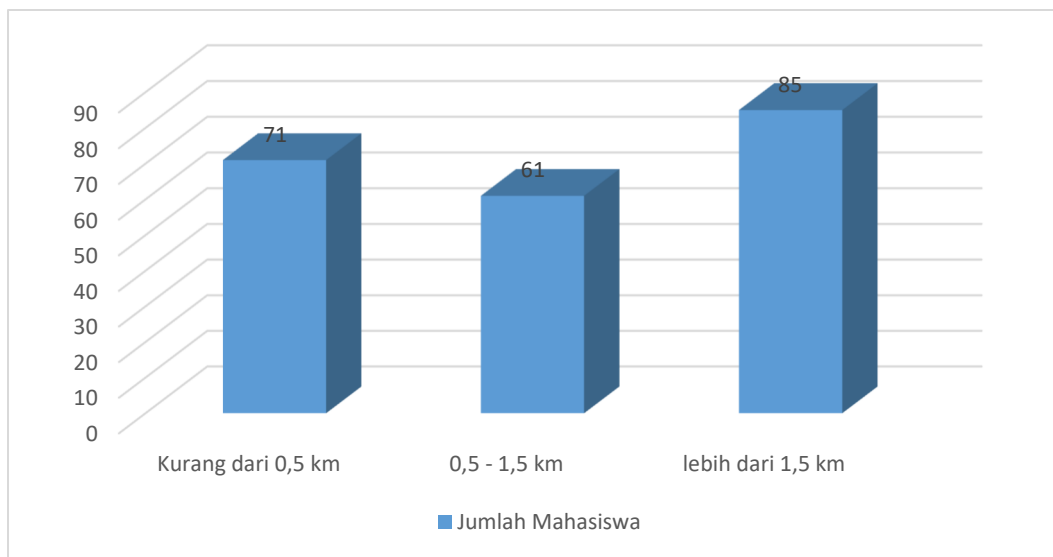


Figure 3. Profile of respondents based on the distance between their residence and the beach

The diagram above shows a comparison of the number of respondents based on the distance between their residence and the beach. From these data, it can be seen that the number of respondents with a residence of more than 1.5 km from the coast becomes the most with the number of 85 people. Even so, this number does not differ much from the other groups of respondents where the group that lives less than 0.5 km from the beach is 71 people and the group that lives between 0.5 - 1.5 km from the beach is 61 people.

However, several other studies also revealed mixed results. Sagala, S., Dwiyani, R., Bajek, R., Takeuchi, Y., & Okada, (2008) examined the correlation between risk perception and preparedness at the household level in Japan for example. In a study conducted in two different communities in the city of Kyoto, the Shuhachi and Jouson communities, sagala, S., Dwiyani, R., Bajek, R., Takeuchi, Y., & Okada, (2008)Sagala, found that there was no significant correlation between risk perception and earthquake preparedness.

(Harris& Hahn, (2011) states that the cause of the low influence of risk perception on preparedness is due to the belief that they have a smaller chance of dealing with bad events. That is, individuals tend to assume that bad events such as disasters will be more likely to afflict others than themselves. Lindell & Whitney, (2000) add that although perceptions of risk in the community are generally high, individuals tend to consider themselves not at risk.

Lindell & Whitney (2000) describes the causes of the differences in the impact of risk perception on preparedness. According to them, the difference can be attributed to the definition and measurement of risk perception that varies. Some definitions are developed with the psychometric paradigm, while

others focus on fear, the severity of the risk, and the perception of the probabilities of an event's closeness.

The psychometric paradigm is used as an approach to identify characteristics that influence a person's perception of risk. Sjöberg, Moen, & Rundmo., (2004) explain that the conclusions obtained from the psychometric paradigm are often not enough based on empirical data and accurate analysis, even if this paradigm is compared to other paradigms, the psychometric paradigm is still better in explaining and predicting perceptions risk. Therefore Basolo, V., Steinberg, L. J., Burby, R. J., Levine, J., Cruz, A. M., & Huang, (2009) said that the relationship between risk perception will forever be difficult to explain until conceptualization of risk perception measurement is formulated and used with acceptable standardization.

Conclusions

This study concludes that there is a significant correlation between perceptions of the tsunami disaster with student preparedness. This means that the higher the perception of disaster, the higher the student's preparedness. Conversely, the lower the perception of disaster, the lower the student preparedness.

The massive role of tertiary institutions is needed in integrating disaster education into the learning curriculum. The knowledge of qualified disaster knowledge can build an attitude of student preparedness. Padang State University, in this case, has inserted disaster management courses as general subjects that must be attended by all students but their duration is only 100 minutes (2 credits). It is hoped that in the future Padang State University can include disaster management courses in each department or faculty and be added to 3 credits so that more focus and deepening of the material can be achieved. Also, disaster material can be adapted to the characteristics of the knowledge clusters in each department or faculty, considering disaster risk reduction is collaborative.

Acknowledgments

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