

Student Attitude to Earthquake Disaster Risk: Role of Motivation and Perception of Risk

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Abstract. Youth awareness and attitudes toward earthquake disasters can assist disaster risk reduction and management efforts to reduce death and economic loss. Students can become a driving force in reducing earthquake risk if they have the right attitude in dealing with earthquake disaster risk. This research aims to analyze students' attitudes to earthquake risk and the role of motivation and perception of risk towards students' attitudes to earthquake risk. Students have the potential to become a driving force in reducing earthquake risk if they have the right attitude in dealing with earthquake disaster risk. Students can be a driving force in reducing earthquake risk if they have the right attitude in dealing with earthquake disaster risk. This research uses quantitative research methods. The research uses an online survey to collect data from 107 students in Padang City and Surakarta City. Researchers use random sampling to distribute the survey. The variables examined in this study are attitudes toward earthquake risk, motivation, and perceptions of earthquake risk. This study used a questionnaire consisting of 67 questions. Data were analyzed using multiple regression analysis with SPSS 26.00. This study found that students have a high attitude toward earthquake risk. The attitude variable is influenced by motivation and perception of earthquake risk by 62.9%, while other variables outside the model studied influence by 37.1%. The motivation and perception of earthquake risk have a significant effect on the attitude variable. Lastly, the perception and motivational variables have a significant effect on the attitude variable partially.

1. Introduction

Disasters are unpredictable and unavoidable, but we can reduce their impact by increasing preparedness knowledge and practices [1]. The community needs an active position to deal with risks but only waits for the results of risk assessments and risk control strategies from experts [2]. Community awareness and attitudes can assist disaster risk reduction and management efforts to reduce death and economic losses [3]. Attitudes towards disasters are crucial for the community because they determine behavior. Attitudes must be accompanied by sufficient knowledge because a lack of information can cause panic when facing a disaster [4].

Attitude theory explains how individuals develop attitudes toward earthquake risk. Attitude consists of three main components, namely cognitive (knowledge

and individual understanding of the risk of earthquakes), affective (aspects of individual feelings towards earthquake risk), and conative (the tendency of individual actions towards earthquake risk) [5].

Human attitude in dealing with risk is influenced by internal and external factors that the individual owns. Internal factors that are suspected to influence attitudes toward disaster risk are the individual's motivation and perception of risk. Perceived risk is a personal decision made by a person about the severity of risk [6]. The perceived seismic risk significantly relates to household preparedness for earthquake disasters [7]. The study conducted by [8] revealed that a community resilience approach that emphasizes one's perception of risk can reduce disaster risk sufficiently.

Motivation can also affect individual attitudes in dealing with earthquake risks. Motivation is an internal drive

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that drives individuals to act. In the context of facing earthquake risk, motivation can relate to the extent to which individuals feel the importance of earthquake risk to themselves. Alderfer's ERG theory [9] states that individuals have three sets of basic needs: existence, relatedness, and growth. The need for existence includes basic human needs such as physiological needs, as well as physical safety; Relatedness needs include individual needs to establish interpersonal relationships, such as with family, friends, and superiors, as well as the need to gain recognition; The need for growth includes the need to develop oneself, and achieve progress.

Earthquake is a disaster that can cause economic and social losses in people's lives. Building societal resilience entails increasing social community's capability of facing disasters, which relies on people's knowledge of disasters and their ability to deal with potential risk in the future [10]. Youth, students, and young professionals tends to have high space to contribute reducing risk. Students are part of the community and have the potential to become a driving force in reducing earthquake risk if they have the right attitude in dealing with earthquake risk. Based on the background mentioned earlier, this study aims to examine students' attitudes toward earthquake risk and the influence of motivational factors and perceptions of disaster risk on students' attitudes toward dealing with earthquake risk.

2. Method

This research uses quantitative research methods. The research uses an online survey to collect data from 107 students in Padang City and Surakarta City. Padang city and Surakarta city were chosen as research locations because the two areas have different earthquake risk indices. Padang city has a high earthquake risk index with a score of 19.68, while Surakarta city has a moderate earthquake risk index with a score of 8.64. Apart from that, the city of Padang experienced a large earthquake with a magnitude of 7.3 on the SR in 2009, while the city of Surakarta has not experienced any large earthquakes for the last 20 years. Researchers use random sampling to distribute the survey. Students give permission to use research data through the willingness to be a respondent form before filling out the online questionnaire. The variables examined in this study are attitudes toward earthquake risk, motivation, and perceptions of earthquake risk. This study used an online questionnaire consisting of 67 questions. The following table shows the description of research variables and indicators.

No	Variable	Indicator	Question-naire Item
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1	Attitude	Cognitive (Knowledge about the causes of earthquakes, secondary risks, Earthquake preparedness steps)	15
		Affective (Emotional reactions to earthquakes, interest in learning earthquake preparedness behavior)	15
		Conative (Tendency of action per earthquake preparedness measures)	15
2	Motivation	Existence (Inducement to take disaster risk reduction measures to protect oneself and family from earthquake risk)	6
		Relatedness (Inducement to establish relationships and cooperate with disaster management agencies, communities, and volunteers in disaster management)	6
		Growth (Inducement to develop oneself through disaster management activities)	6
3	Earthquake Risk Perception	Perceptions of earthquake disaster risk and perceptions of disaster risk reduction measures	15

Data collection was carried out using a questionnaire designed to measure student characteristics, attitudes toward earthquake risk, motivation, and perceptions of earthquake risk. Multiple linear regression analysis using SPSS 26.00 software was used to determine the effect of motivational and perception variables on student attitudes in dealing with earthquake risk.

3. Result and Discussion

3.1. Descriptive Analysis

Respondents from this study amounted to 107 students consisting of 55 women and 52 men. A total of 103 respondents are less than 25 years old, while four are more than 25 years old.

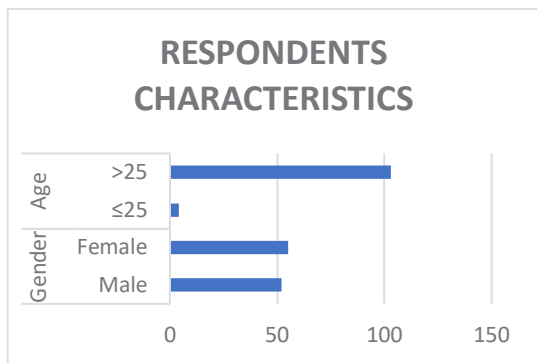


Fig. 1. Respondents Characteristics

Validity and reliability tests were carried out to determine the quality of the research instruments used in the study. This study used a questionnaire consisting of 78 questions, but after being tested for validity, 11 questions were invalid, leaving 67 questions valid. The reliability test results showed that the instrument was reliable because it had a Cronbach alpha value > 0.6.

Reliability

Scale: ALL VARIABLES

		N	%
Cases	Valid	107	100.0
	Excluded ^a	0	.0
	Total	107	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.962	67

Fig. 2. Cronbach's Alpha

The attitude components examined in this study are cognitive, affective, and conative. The maximum score obtained on the question item is 5, and the minimum score is 1. The score obtained is categorized into three categories: positive, neutral, and negative. In the cognitive component, the average score obtained is 4.31, included in the positive category. In the affective component, the average score obtained is 4.05, and in the conative component, 4.39, both are included in the positive category. The accumulation of the three attitude components obtained an average score of 4.25; the overall average attitude variable was included in the positive category.

Table 1. Attitude Indicator.

Variable	Attitude			Total Score (Attitude)
	Cognitive	Affective	Conative	
Indicators	Knowledge about the causes of earthquakes, risks associated, Earthquake preparedness steps	Emotional reaction to earthquakes, interest in learning earthquake preparedness behavior	Tendency to act according to earthquake preparedness steps	
Average Score	4,31	4,05	4,39	4,25
Description	Positive	Positive	Positive	Positive

Figure 1 presents the frequency distribution of the attitude variable components. Of the 107 research respondents, on the total score of the attitude variable, 95 respondents belonged to the positive category and 11 respondents belonged to the neutral category, and one respondent to the negative category. The three components of attitude, namely cognitive, affective, and conative, indicate that the majority of respondents' scores on these three components fall into the positive category. In the conative and affective components, one respondent has a negative attitude score category.

The motivational variable is measured using three indicators: existence, relatedness, and growth. The results showed that the average obtained from the three components of motivation, namely existence 4.27, relatedness 4.41, and growth 4.51. The average motivation variable is 4.40, which is included in the high category.

Table 2. Motivation Indicator

Indicator	Motivation			Motivation
	Existence (Inducement to take disaster risk reduction measures to	Relatedness (Inducement to establish relationships and cooperate with disaster	Growth (Inducement to develop oneself through	

	protect oneself and family from earthquake risk)	management agencies, communities, and volunteers in disaster management)	disaster management activities)	
Average Score	4,27	4,41	4,51	4,40
	High	High	High	High

Figure 2 shows the frequency distribution of the motivational variable. The scores of the three motivational components are mainly in the high category. In the existence component, 94 respondents belonged to the high category, 12 respondents to the medium category, and one respondent to the low score category. In the relatedness component, 95 respondents scored in the high category, 11 in the medium category, and one respondent in the low score category. The growth component included 100 respondents who scored in the high category, six in the medium category, and one in the low category. In general, the total score of the majority of respondents from the motivation variable was included in the high category (99 respondents). In comparison, the other eight respondents were included in the medium category.



Fig. 3. Motivation Chart

Perceptions of earthquake risk are measured using indicators, namely perceptions of earthquake disaster risk and perceptions of disaster risk reduction measures. We categorized scores into three groups, i.e., high, medium, and low. The average score obtained is 4.10, included in the high category.

Table 3. Perception of Earthquake Risk

Indicator	Perception of Earthquake Risk
Average score	4,10
Category	High

Figure 3 delivers the frequency distribution of the variable perception of earthquake risk. Figure 4 shows that as many as 85 respondents have a high perception of earthquake risk, 21 are classified as medium, and one respondent is classified as a low category.

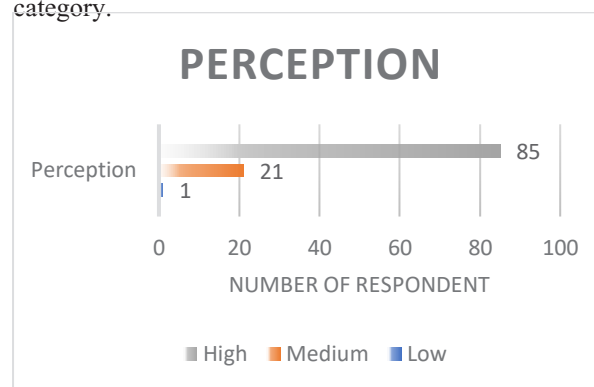


Fig. 4. Perception Chart

Multiple linear regression analysis was conducted to determine the effect of motivational variables and perceived earthquake risk on attitude variables. The results of multiple linear regression analysis are presented in Figure 5.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.797 ^a	.636	.629	10.19824

a. Predictors: (Constant), motivasi, persepsi

Fig. 5.

Furthermore, Figure 5 shows that the adjusted r square value is 0.629. This shows that the attitude variable is influenced by the variables of motivation and perception of earthquake risk by 62.9% while 27.1% is influenced by other variables outside the model studied.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18877.057	2	9438.528	90.752	.000 ^b
	Residual	10816.420	104	104.004		
	Total	29693.477	106			

a. Dependent Variable: sikap
 b. Predictors: (Constant), motivasi, persepsi

Fig 6

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	42.074	8.278		5.082	.000
	persepsi	.913	.184	.394	4.947	.000
	motivasi	.784	.131	.478	5.992	.000

a. Dependent Variable: sikap

Fig 7

In order to determine the simultaneous effect of motivational variables and perceptions of earthquake risk on attitude variables, the study looks at the significance of each variable. Figure 7 indicates that the significance obtained by the model is 0.000. This shows that motivation and perception of earthquake risk have a significant effect on the attitude variable.

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	42.074	8.278		5.082	.000
	persepsi	.913	.184	.394	4.947	.000
	motivasi	.784	.131	.478	5.992	.000

a. Dependent Variable: sikap

Fig 8

Researchers looked at the significance of each variable to determine the effect of each variable partially on the attitude variable. Figure 8 depicts that the variables of perception and motivation have a coefficient of 0.000. That means that the perception variable and motivational variable partially have a significant effect on the attitude variable. The regression equation obtained in this study is as follows:

$$Y=42,074+0,913X1+0,784X2 \quad (1)$$

Based on the previous description, the higher the motivational variable will be followed by an increase in the attitude variable. Likewise, with the perception variable, the higher the perception variable, the higher the attitude variable will be followed.

3.2. Discussion

Based on the analysis of the result on 107 students in Padang and Surakarta, perceptions and motivation influence respondents' attitudes by 62.9%. This result explains that perceptions and motivation significantly affect attitudes in dealing with earthquake disasters.

Consecutively, the results of previous research also revealed that attitude is one of the essential factors in dealing with disasters since attitude indicates a behavior's tendency. Students in this study already have perceptions related to earthquake disaster risk reduction. This statement can be seen from the results of calculating the average total attitude score of 4.25, which is relatively high.

Research [11] compared knowledge of location-based disaster response with respondents living in rural, peri-urban/urban areas. Most respondents who live in Shunyi are surrounded by mountains and rivers with higher disaster risks than in urban and suburban areas, which makes people living in rural areas more prepared to face disasters. Li's research shows that economic status has no significant effect on residents' knowledge of disaster response and demonstrates equity in health in this disaster control area. Residents with better economic status do not show any advantage over those with lower incomes.

Furthermore, in Li's research, out of 847 respondents, 44.2% had general advanced knowledge of disaster response. While only 9.4% know how to react to manufactured disasters, and 61.4% have advanced disaster response knowledge. Rural residents and those with higher education had more knowledge of disaster response ($P<0.05$). Nevertheless, economic status insignificantly affects residents' knowledge of disaster response.

Based on the results of research on the motivation component, the majority of respondents belong to the high category. We can see that from the results of the motivation variable, which is measured using three indicators: existence, relatedness, and growth. Responses from students regarding motivation indicators obtained an average motivation variable of 4.40 which is in the high category. Motivation refers to the desire and potential possessed by students to generate enthusiasm in reducing disaster risk. The role of motivation is compelling in directing someone to grow in relations with fellow students and with the community for discussion and providing education to a broad audience related to disaster risk reduction. The results of this study show that the three motivational indicators, namely existence, relatedness, and growth in students, greatly influence disaster risk reduction. Good motivation will increase enthusiasm and ability to deal with earthquake disasters to encourage students to take

action to reduce the risk of earthquake disasters and minimize losses due to earthquake disasters.

Furthermore, the research analysis results on 107 respondents also revealed a total score on the attitude variable. A total of 95 respondents belonged to the high category and 11 respondents belonged to the medium category, and one to the low category. This shows that most students have a high attitude toward reducing disaster risk. Based on the results of research on earthquake disasters, it can be seen that students have a high perception score. This result shows that students have an excellent perception of earthquake disaster risk reduction from the responses to questions that affect cognitive attitudes (causes of earthquakes, associated risks, earthquake preparedness steps) by 4.31. The indicator with the lowest average score for student responses is emotional reactions to earthquakes and interest in studying earthquake preparedness behavior, which is 4.05. The number shows that affective attitudes are lower when compared to cognitive and conative attitudes. These results are because students feel lacking in the training of communicating emotionally but master the steps in dealing with earthquake disasters, which is indicated by a tendency score of action following earthquake preparedness measures of 4.39.

Furthermore, the research results also reveal that statistically, student attitudes are significantly influenced by motivation and perception (sig 0.00). This number implies that students' good attitudes towards earthquake disasters can be improved by strengthening their perceptions of disaster risk and high motivation to reduce disaster risk. Analysis of motivational and perception variables is vital in reducing and dealing with earthquake disasters. It is necessary to prevent reducing student motivation and perceptions.

Therefore, the government and educational institutions need several training policies related to disaster risk reduction and educational activities that are more sustainable and available to the general public. This effort is helpful in order to promote knowledge and increase capacity for self-rescue, and help each other during a disaster [12].

In addition, the attitude score in this study was higher (p-value $0.036 < \alpha 0.05$) compared to Andris' study [13]. [1] The results of this study align with research conducted by Tan [12] with the result that disaster education affects the perception of behavioral control of students who are respondents. The study explained that earthquake preparedness and anticipation are easy to do, so it does not become an obstacle for students. Respondents [2] consider that adequate facilities and infrastructure, such as evacuation routes and gathering points, are supporting factors in anticipating earthquake disasters. [3] As long as students feel that there are many sustaining

factors, students tend to bring up positive behavior in earthquake disaster preparedness easily.

In contrast to Turale's research [14], where none of the respondents had received disaster nursing training before being involved in the earthquake disaster site, this study shows the number of respondents who have attended training that the preparedness of respondents in Indonesia is higher when compared to respondents in China.

Based on the discussion above, a implications consists of theoretical and practical. A theoretical implications focus on education policy that Indonesia needs to develop aspects of perspective and motivation to improve attitudes toward earthquake disasters. Therefore, the Ministry of Education, educators, and the government must help improve preparedness and reduce the adverse effects of earthquake disasters. A practical implications of this research are used as recommendation for students to improve themselves to increasing capacity by knowledge methods and can motivate student awareness to reduce disaster risk.

4. Conclusion

This study found that students have a high attitude toward earthquake risk. The attitude variable is influenced by motivation and perception of earthquake risk by 62.9%, while other variables outside the model studied influence by 37.1%. The motivation and perception of earthquake risk have a significant effect on the attitude variable. Lastly, the perception and motivational variables have a significant effect on the attitude variable partially.

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