

# THE EFFECT OF INDIVIDUAL KNOWLEDGE, SHARED TRAINING AND SELF-EFFICACY ON MITIGATION MANAGERIAL CAPABILITY

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## ABSTRACT

*Increased preparedness is an essential element of pro-active disaster risk reduction management. Many factors affect the preparedness of adolescents in dealing with disaster management, including knowledge, attitudes, disaster preparedness training, and self-efficacy. The purpose of this study was to determine what factors influence the preparedness of adolescents to mitigation capability. Preparedness is a series of activities carried out to anticipate disasters through organizing and through appropriate and effective steps which are grouped into four parameters, namely knowledge and attitudes, emergency planning, warning systems and resource mobilization. This type of correlational research in this study uses a cross sectional approach. The population in this study was 620 people with a sample of 229 people. Sampling technique was conducted by using purposive sampling and cluster random sampling, the instrument is declared valid and reliable. Collecting data was by using questionnaires and statistical analysis using simple linear regression and multiple linear regression. The results showed that there was a significant effect of knowledge on preparedness ( $p$ -value = 0.000), attitude towards preparedness ( $p$ -value, 0.000), training on preparedness ( $p$ -value= 0000), self-efficacy on preparedness ( $p$ -value, 0.000). In conclusion, there is an effect of knowledge, attitude, disaster preparedness training and self-efficacy on adolescent preparedness in dealing with disasters. It is hoped that the stakeholders will improve disaster preparedness by seeking more information related to disasters and being involved in disaster-related institutions or organizations.*

**Keywords:** Knowledge, Attitude, Training, Self-Efficacy, Mitigation Management, Managerial Capability.

## INTRODUCTION

Based on BNPB (*Badan Nasional Penanggulangan Bencana*/National Agency for Disaster Management) data in 2018-2019, it shows that the incidence of landslides is in the 3rd highest position with 814 landslides which caused many fatalities with 167 people who died and lost, injured as many as 202 people, 38,198 victims suffered and displaced (BNPB, 2017). Landslide is a type of mass movement of soil or rock, or a mixture of the two, down or out of the slope as a result of disturbing the stability of the soil or rock making up the slope (BNPB, 2017). There are many impacts caused by landslides in the form of many fatalities and injuries, many damages to facilities and environmental damage (Nandi, 2007). Everyone has the risk of potential disaster, so disaster management is everybody's business. Therefore, it is necessary to share roles and shared responsibility in increasing preparedness at all age levels, one of which is adolescents (BNPB, 2017). Adolescents are included in the age group vulnerable to disasters, so teenagers need to prepare for disasters in the context of disaster management.

In disaster management, there are several aspects, including aspects of disaster mitigation and prevention, disaster preparedness, and aspects of rehabilitation. Increased preparedness is one of the important elements of pro-active disaster risk reduction activities, before a disaster occurs (Nurhalimah et al., 2017). Preparedness is the steps that enable governments, community organizations and individuals to respond quickly and effectively to disasters (Aziz, 2018). Preparedness is grouped into four parameters, namely knowledge and attitudes, emergency planning, warning systems and resource mobilization (LIPI, & UNESCO/ISDR, 2006)). There are many factors that affect the preparedness of adolescents in the face of landslides, including knowledge, attitudes, disaster preparedness training, and self-efficacy (Syarif & Mastura, 2015). The purpose of this study was to determine what factors influence the preparedness of adolescents to face landslides in a village in Sukabumi, West Java. Preparedness is a series of activities carried out to anticipate disasters through organizing and through appropriate and effective steps which are grouped into four parameters, namely knowledge and attitudes, emergency planning, warning systems and resource mobilization

## RESEARCH METHODS

This type of research used in this study is a correlational study with a cross sectional approach. The populations in this study were 620 people with a sample of 229 people. The sampling technique used purposive sampling and cluster random sampling. Collecting data in this study was by using a questionnaire and statistical analysis used is simple linear regression analysis and multiple linear regression analysis.

## RESULTS

### Respondent Characteristics

Table 1 shows that the average age of the respondents is 18 years, the average length of stay is 17 years, most of the respondents have junior high school education, namely 122 people (53.7%), and most of the respondents are women, as many as 123 people (55,3%) and live with their parents, as many as 207 people (90.4%). Moreover, most of the respondents have never been hit by landslides, namely 203 people (88.6%).

<b>Respondent Characteristics</b>	<b>Frequency</b>	<b>%</b>
Education:		
Primary School	3	1.3
Junior High	122	53.3
High School	103	45.0
College	1	0.4
Gender:		
Male	106	46.3
Female	123	53.7
Residence Status:		
Parents	207	90.4
Sibling	5	2.2
Others	17	7.4
Experience with Landslide Disaster:		
Yes	26	11.4
No	203	88.6

<b>Variables</b>	<b>Classification</b>	<b>F</b>	<b>(%)</b>
Knowledge	High	89	38.9
	Moderate	55	24.0
	Low	85	37.1
Attitudes	Support	223	97.4
	Less Support	6	2.6
Preparedness Training	Ever	42	18.3
	Never	187	81.7
Self-Efficacy	High	122	53.3
	Moderate	91	39.7
	Low	16	7.0
Preparedness	Very ready	49	21.4
	Ready	8	3.5
	Almost ready	82	35.8
	Less ready	78	34.1
	Not ready	12	5.2
Total		229	100

Based on Table 2, it shows that most of the knowledge of adolescents is good, namely as many as 89 people or 38.9%. It shows that most respondents know that contributing to technical guidance, providing materials is indispensable to support disaster preparedness. It can be seen that most of the adolescent attitudes were supportive, namely as many as 223 people or 97.4%. It can be seen that most of the respondents have never attended disaster preparedness training, namely 187 people or 81.7% and that most of the respondents have high self-efficacy, namely as many as 122 people or 53.3%.

Table 2 also shows that most respondents have good self-efficacy on generality indicators related to disaster preparedness. Most respondents believe that they will always be able to respond to situations during landslide emergencies with a positive attitude and use life experiences as a step to be more prepared for landslides. Lastly, it shows that the majority of respondents have almost ready disaster preparedness, namely as many as 82 people or 35.8%. Meanwhile, based on the combined preparedness index value according to LIPI-UNESCO, the index value is 56%, which means it is in the almost ready category.

### Classic Assumption Test

The normality test using the Kolmogorov-Smirnov Test shows that the  $p$ -value = 0.188 means  $> 0.05$  which indicates that the data obtained follows the normal distribution rules. The linearity test using Linearity shows the  $p$ -value for knowledge (0.000), attitude (0.000), and self-efficacy (0.000), the  $p$ -value for all variables  $< 0.05$ . Thus, it can be stated that the variables of knowledge, attitude and self-efficacy towards disaster preparedness have a linear pattern. The autocorrelation test was carried out using Durbin-Watson, it was obtained that the Durbin-Watson value was 1.843, then compared with the Durbin-Watson tables value, namely  $du = 1.806$  and  $4-du = 4 - 1.806 = 2.193$ , so that it could be seen that the Durbin Watson value was between the values  $du$  and  $(4-du)$  ( $1,806 < 1,843 < 2,193$ ), it can be said that in this test there is no autocorrelation. To detect the presence or absence of multicollinearity in the regression model, variance inflation factor (VIF) is used. The VIF value obtained for knowledge (1.163), attitude (1.401), training (1.203) and self-efficacy (1.428), the VIF value for all variables  $< 10$ , it can be said that in this test multicollinearity did not occur. The test used to detect heteroscedasticity in the regression model is the Spearman rho test. The Spearman rho value for knowledge (0.491), attitude (0.727), training (0.823) and self-efficacy (0.912), all  $p$ -values on each variable  $> 0.05$  so that heteroscedasticity does not occur.

### Bivariate Analysis

Model		Unstandardized Coefficients	t	Sig.
1	(Constant)	40.452	49.109	0.000
	Knowledge	1.654	23.199	0.000
2	(Constant)	29.404	4.217	0.000
	Attitudes	0.760	3.976	0.000
3	(Constant)	54.807	71.101	0.000
	Training	11.812	6.562	0.000
4	(Constant)	32.068	9.601	0.000
	Self-Efficacy	0.554	7.616	0.000

The results of the simple regression coefficient analysis in Table 3 showed a  $p$ -value of  $0.000 < 0.05$ . This means that there is significant effect of knowledge (X1) on disaster management capability (Y). The simple regression coefficient of the effect of attitudes (X2) on disaster management capability (Y) showed  $p$ -value of  $0.000 < 0.05$ . This means that there is a

significant effect of adolescent attitudes (X2) on adolescent disaster management capability (Y). Based on this equation, it can be calculated that every increase of one unit of X2 will cause Y to increase by 0.760.

The results also showed the effect of training (X3) on adolescent disaster management capability (Y) with p-value of  $0.000 < 0.05$ , which means there is a significant effect of training (X3) on disaster management capability (Y). Based on this equation, it can be shown that every increase of one unit of X3 will cause Y to increase by 11,812. Table 3 also revealed the simple regression coefficient analysis with a p-value of  $0.000 < 0.05$ . Thus, there is a significant effect of self-efficacy (X4) on disaster management capability (Y). Based on this equation, it can be shown that every increase of one unit of X4 will cause Y to increase by 0.554. To describe the relationship between X1 and Y variables, a simple linear regression equation model is created as follows:

$$Y = 40.452 + 1.654 X1 + \varepsilon$$

$$Y = 29.404 + 0.760 X2 + \varepsilon$$

$$Y = 54.807 + 11.812 X3 + \varepsilon$$

$$Y = 32.068 + 0.554 X4 + \varepsilon$$

Furthermore, testing the feasibility of the model, with the following analysis results.

Model	Relationship	Feasibility	Sum of Squares	DF	F	Sig.
1	Knowledge (X1) → Preparedness (Y)	Regression	21105.623	1	538.178	0.000
		Residual	8902.220	227		
		Total	30007.843	228		
2	Attitudes (X2) → Preparedness (Y)	Regression	1954.073	1	15.812	0.000
		Residual	28053.770	227		
		Total	30007.843	228		
3	Training (X3) → Preparedness (Y)	Regression	4784.869	1	43.063	0.000
		Residual	25222.974	227		
		Total	30007.843	228		
4	Self-Efficacy (X4) → Preparedness (Y)	Regression	6106.739	1	57.999	0.000
		Residual	23901.104	227		
		Total	30007.843	228		

Based on Table 4, it shows the feasibility test of the relationship between knowledge (X1) and preparedness (Y) with p-value (Sig.) of  $0.000 < 0.05$ . Thus, the model is appropriate to describe the effect of Knowledge (X1) on Preparedness (Y). The value of the feasibility test of the relationship between Attitudes (X2), Training (X3) and Self-Efficacy (X4) on Preparedness (Y) also showed the p-value (Sig.) of  $0.000 < 0.05$ . Thus, the model is appropriate to describe the effect of Attitudes (X2), Training (X3) and Self-Efficacy (X4) on Preparedness (Y).

In addition, to see the strength and magnitude of the influence of X1 on Y, analysis of the correlation coefficient and determination is carried out as follows:

<b>Model</b>	<b>R</b>	<b>R Square</b>
1	0.839	0.703
2	0.255	0.065
3	0.399	0.159
4	0.451	0.204

Based on Table 5, it is found that the correlation value (R) of the effect of X1 (Knowledge) on Y (Preparedness) is 0.839. Based on the interpretation of the correlation coefficient including the very strong category and is positive (unidirectional). Furthermore, to see the magnitude of X1's contribution to Y, it can be seen from R Square, which is 0.703. This value shows that the knowledge variable of adolescents can describe the disaster management capability by 70.3%. The correlation value (R) of the effect of X2 (Attitudes) on Y (Preparedness) is 0.255, based on the interpretation of the correlation coefficient including the weak category and is positive (unidirectional). Furthermore, to see the magnitude of X2's contribution to Y, it can be seen from R Square, which is 0.065. This value shows that the attitude of adolescents can describe the disaster management capability by 6.5%.

Moreover, the correlation value (R) of the effect of X3 (Training) on Y (Preparedness) is 0.399, based on the interpretation of the correlation coefficient including the weak category and is positive (unidirectional). Furthermore, to see the magnitude of X3's contribution to Y, it can be seen from R Square, which is 0.159. This value shows that the disaster preparedness training variable can describe the preparedness of adolescents in the face of landslides by 15.9%. It is also found that the correlation value (R) of the effect of X4 (Self-Efficacy) on Y (Preparedness) is 0.451, based on the interpretation of the correlation coefficient including the strong enough category and is positive (unidirectional). Furthermore, to see the magnitude of X4's contribution to Y, it can be seen from R Square, which is 0.204. This value shows that the adolescent self-efficacy variable can describe the disaster management capability by 20.4%.

### **Multivariate Analysis**

Based on the results of the multiple regression coefficient analysis in Table 6, it can be concluded that of the four variables, all variables significantly affect adolescent disaster management capability because they have each p-value of less than 0.05.

<b>Model</b>	<b>Unstandardized Coefficients</b>	<b>t</b>	<b>Sig.</b>
(Constant)	11.139	3.377	0.001
Knowledge	1.575	26.581	0.000
Attitude	0.650	6.620	0.000
Training	3.937	4.355	0.000
Self-Efficacy	0.129	3.147	0.002

To describe the relationship of the variables X1, X2, X3, X4 to Y, a multiple linear regression equation model is made as follows:

$$Y = 11.139 + 1.575 X_1 + 0.650 X_2 + 3.937 X_3 + 0.129 X_4 + \epsilon$$

Based on this equation, it can be concluded that every increase of one unit of  $X_1$  will result in  $Y$  increasing by 1.575, every increase of one unit of  $X_2$  will cause  $Y$  to increase by 0.650, every increase of one unit of  $X_3$  will cause  $Y$  to increase by 3,937, and every increase of one unit of  $X_4$  will result in  $Y$  increased by 0.129. Furthermore, testing the overall feasibility of the model, with the following analysis results being shown in Table 7.

<b>Model</b>	<b>Sum of Squares</b>	<b>DF</b>	<b>F</b>	<b>Sig.</b>
Regression	24788.870	4	265.987	0.000
Residual	5218.972	224		
Total	30007.843	228		

Based on Table 7, it shows the p-value (Sig.)  $0.000 < 0.05$ . Thus, the model is appropriate to describe the effect of  $X_1$ ,  $X_2$ ,  $X_3$ ,  $X_4$  on  $Y$ .

In addition, to see the strength and magnitude of the influence of  $X_1$ ,  $X_2$ ,  $X_3$ ,  $X_4$  on  $Y$ , the correlation coefficient and determination analysis is carried out as shown in Table 8.

<b>Model</b>	<b>R</b>	<b>R Square</b>
1	0.909	0.826

Based on Table 8, the correlation value (R) is 0.909, based on the interpretation of the correlation coefficient including the Very Strong category and is positive (unidirectional). Furthermore, to see the magnitude of the contribution of  $X_1$ ,  $X_2$ ,  $X_3$ ,  $X_4$  to  $Y$ , it can be seen from R Square, which is 0.826, this value shows the variables of adolescent knowledge, adolescent attitudes, Training followed by adolescents and adolescent self-efficacy can describe adolescent preparedness to face landslides of 82.6%.

## **DISCUSSION**

### **The Influence of Knowledge on Mitigation Capability**

The results showed that there was a significant influence on adolescent knowledge about landslide disaster preparedness on youth preparedness in facing landslide disasters. The results of this study are supported by research by (Purwoko, 2015); Budimanto & Tahlil (2017) which show that there is a significant influence between the level of knowledge about disaster risk and youth preparedness in the face of disasters. The results of the study are reinforced by research by (Fauzi & Sukandi, 2017; Andini, 2019) which also shows that adolescent knowledge affects disaster mitigation. The level of preparedness for landslides can be measured by paying attention to several factors, one of which is knowledge (Andini, 2019). The knowledge that must be possessed is an understanding of disasters and an understanding of disaster preparedness,

including an understanding of appropriate self-rescue actions when a disaster occurs as well as actions and equipment that need to be prepared before a disaster occurs (Budimanto & Tahlil, 2017). The level of knowledge on disaster management is a basic aspect that should be possessed by every community, including teenagers, to be able to provide information to their family members when a disaster occurs (Setyaningrum & Rumagutawan, 2018). Wulandari et al. (2019) stated that individual knowledge including adolescents about hazards, vulnerabilities, risks and risk reduction activities will be able to create effective community action independently or in collaboration with other stakeholders in dealing with disaster. The level of preparedness of a person can be shaped by how often the person gets knowledge or information about prevention and preparedness (Fitriana et al., 2017; Dewi et al., 2020). The results showed that most of the respondents had good knowledge, thus encouraging the preparedness of the respondents; most of them were in the ready category.

### **The Effect of Attitudes on Mitigation Capability**

The results showed that there was a significant influence on adolescent attitudes towards disaster preparedness. These results are supported by research by (Chotimah, 2019; Adiwijaya, 2017) which show that attitudes have a positive and significant impact on preparedness in facing landslides. Attitudes are always related to emotional components, cognitive components (perceptions, opinions, beliefs) and behavior (Rahmayani, 2018). Attitude plays a major role in one's preparedness in saving oneself from disasters, meaning that the better the attitude about disasters, the more prepared they will be to face disasters (Hesti et al., 2019). LIPI & UNESCO/ISDR (2006) stated that an attitude and a sense of care can influence disaster preparedness. Attitude indicators for dealing with disasters include efforts to prevent disasters from occurring, examining environmental conditions that are likely to cause disasters, participating in socialization and training activities. In improving disaster preparedness, teenagers must have a good attitude and concern for disaster preparedness (Solikhah et al., 2020). A caring attitude creates a spirit of preparedness for both oneself and other communities so that the process of self-rescue can occur. Attitudes will influence a person's behavior through a decision-making process, in this case the individual's attitude in making decisions to continue to carry out disaster preparedness. The better the attitude you have, the better prepared you are to deal with a disaster. The results of this study indicate that most respondents have a supportive attitude towards landslide disaster preparedness, thus encouraging preparedness, most of which indicate that they are almost ready to face landslides.

### **The Effect of Training on Mitigation Capability**

The results showed that there was a significant effect of Disaster Alert Training on Youth Preparedness in Facing Landslide Disasters. These results are supported by research by (Pratiwi, 2016; Ferianto & Hidayati, 2019) which show that there is a significant effect of disaster management training on mitigation capability behavior. The results of the study were also reinforced by research by (Murtaqib & Widayati, 2017; Haryuni, 2018; Yudi et al., 2019), which showed that there was a significant effect of training and disaster simulation on mitigation capability. In addition, these results are consistent with the BNPB (2015) which stated that the main objective of disaster management training is to improve preparedness.



Strategic steps that can be taken to improve disaster preparedness are by providing training on disaster management. Disaster management training empowers participants by providing basic life and safety skills needed to be safe "get safe" and stay safe "stay safe" during a disaster so that participants can avoid the impact of natural disasters, and can provide first aid to victims and methods. Evacuation if a natural disaster occurs. Training activities are an effective, dynamic, and sustainable strategy in the dissemination of disaster education (Utami & Nanda, 2018). The results showed that some adolescents had experienced or attended disaster preparedness training, thus enabling them to have an almost ready level of preparedness.

### **Effect of Self Efficacy on Mitigation Capability**

Based on the results of the study, it shows that there is a significant effect of self-efficacy on mitigation capability. The results of this study are in line with the research of (Syarif & Mastura, 2015; Shafithri, 2017) which state that there is a significant influence on the self-efficacy of individuals with disaster preparedness. The results of the study are reinforced by research by (Tumurang et al., 2019) which stated that self-efficacy and training affect disaster preparedness, while (Kalpana & Dirhamsyah, 2016) stated that increasing self-efficacy with Training affects disaster preparedness actions. The higher the self-efficacy of adolescents, the more ready adolescents are in dealing with disasters, indicated by a strong belief in their ability to be involved in disaster preparedness and adolescents tend to be more confident in taking action for disaster emergency response. This strong belief can make teenagers more responsive to disaster emergencies through disaster preparedness. So that the higher the self-efficacy of adolescents can affect disaster preparedness in adolescents (Tumurang et al., 2019). Landslide disaster is one of the big problems for every teenager who experiences it, so teenagers who can solve and survive these problems make them more confident, optimistic and confident in their ability to face problems in the future. This is reinforced by Syarif & Mastura (2015) which stated that an optimistic attitude in facing disasters can provide confidence to face future disasters.

### **CONCLUSION**

The results empirically showed that most of respondents have good knowledge, are supportive, have high self-efficacy and are almost ready for disaster preparedness but mostly have never attended disaster preparedness training. This affects the preparedness index value which is almost ready. More specifically, empirical calculations showed that there is a significant influence on adolescent knowledge, attitudes, training and self-efficacy regarding landslide disaster preparedness on adolescent preparedness with the equation model  $Y = 11.139 + 1.575 X1 + 0.650 X2 + 3.937 X3 + 0.129 X4 \epsilon$ .

The results showed that there was a simultaneous or shared influence of knowledge, attitudes, training and self-efficacy on mitigation capability. The results prove that there is a relationship between the four aspects in influencing disaster preparedness. More specifically, the results encourage the importance of training as a short-term educational process using systematic and organized ways and procedures where training participants will learn practical knowledge and skills for specific purposes. By conducting disaster training, an individual will gain knowledge and skills in dealing with disasters so that with the training carried out, knowledge about disasters will increase. Along with increased knowledge about disaster preparedness, it encourages to have a strong and positive attitude towards disaster preparedness. A good

knowledge of preparedness will form a good attitude about preparedness. The existence of disaster training, good knowledge of disaster preparedness and a positive attitude will give an individual a high level of confidence to do something including disaster preparedness. The results showed that some respondents had experience related to disaster training; most respondents had good knowledge, positive attitudes and high self-efficacy so that disaster preparedness was increased.

## SUGGESTIONS

For further researchers, it is expected that the next researcher will conduct research by adding the respondent's characteristic variables such as age, age, gender and others. It is hoped that the people, especially teenagers, will improve disaster preparedness by seeking more disaster-related information from social media such as the internet and electronic media such as radio and TV and being involved in disaster-related institutions or organizations. For National Agency for Disaster Countermeasure, it is hoped that they can provide information related to sustainable disasters and make efforts to improve community preparedness, especially teenagers through activities in the form of training, seminars, workshops related to natural disasters, especially landslides. Lastly, for the district education office, it is expected to encourage all levels of schools, both elementary, junior high and high school, to include local content subjects and teaching materials that contain disaster preparedness considering that Sukabumi is an area with a high risk of landslides.

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