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Students' Knowledge, Attitude, and Behavior Towards Flood Preparedness: A Case Study at a Junior High School in Bekasi, Indonesia

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Abstract

Preparedness in dealing with the coming of floods is very important for the community because, with preparedness, the community can prepare themselves and do first aid after a disaster. knowledge, attitude, and behavior are factors that influence preparedness. This study aims to determine knowledge, attitude, and behavior about flood preparedness at a junior high school in Bekasi, Indonesia. This research method uses quantitative method. Based on data processing and analysis of research conducted regarding the influence of knowledge, attitude, and behavior about flood disaster preparedness in a junior high school in Bekasi, it is concluded that the disaster actions of junior high school in Bekasi positively influence flood disaster preparedness. In this study, it was also found that the variables of knowledge, attitudes, and actions together influence 9% of flood preparedness, while other factors influence the rest.

Keywords: Attitude, Behavior, Flood Disaster, Knowledge

INTRODUCTION

Indonesia is an archipelagic country located on the Pacific Ring of Fire or a region with a lot of tectonic activity, making it prone to earthquakes, landslides, tornadoes, and floods. According to the World Health Organization (WHO), a disaster is a sudden event that causes some loss and damage (Landsman, 2014). One of the most frequent disasters in Indonesia is floods. A flood is an event where water inundates parts of the surface that are usually dry, such as settlements, plantations, rice fields, etc., because of overflowing water, which is more than capacity and causes losses both morally and materially (Yunida et al., 2017).

Based on data from the National Disaster Management Authority, the number of flood events in Indonesia in 2019 was 790, the majority of which were caused by rainfall and high intensity, with a total death toll of 263 people, 104 missing victims, 1088 injured victims, as well as material losses such as houses. Around 16390 were damaged, 222067 houses were submerged, and 2382 public facilities were damaged. Flood events in Indonesia in 20120 amounted to 1609 incidents, the majority of which were caused by rainfall and high intensity with a total of 235 fatalities, 27missing victims, 282 people were injured, as well as material losses such as 39199 damaged houses, 1032358 submerged houses, and 2851 damaged public facilities. Meanwhile, flood events in Indonesia in 2021 amounted to 1933 events, the majority of which were caused by rainfall and high intensity, with a total of 337 deaths, 67 missing victims, 2034 injured victims, and material losses such as 94667 damaged houses, 1489442 submerged houses, and 1271 damaged public facilities. Based on the above data on flood events in Indonesia during the years 2019-2021, it can be concluded that during these three years, the

incidence of floods in Indonesia has experienced an increase in incidents accompanied by an increase in loss of life and material (National Disaster Management Authority, n.d).

West Java is one of the areas with the highest number of flood events in Indonesia. Based on data from the West Java Regional Disaster Management Authority, flood events in West Java during 2019-2021 were 162 incidents in 2019, with four people dead, 6946 displaced people, 521 families submerged in house losses, 27 schools submerged. Meanwhile, there were 215 incidents of floods in 2020, with 30 deaths, 4088030 displaced people, 1846 families submerged in houses, and 169 schools submerged. In 2021, there were 101 incidents with 11 deaths, 97,978 displaced people, 438 submerged families lost houses, and 27 schools resubmerged. Based on these data, it can be concluded that the number of flood events during 2019-2021 in West Java tends to increase, and the losses incurred also increase. From 2019 to 2021, Bekasi City is in the top three with the most flood events in West Java (West Java Regional Disaster Management Authority, n.d). However, the number of losses caused by flooding in Bekasi City is the largest compared to other areas in West Java. This is because Bekasi is a densely populated city. Apart from that, the massive construction in Bekasi has transformed land that was previously paddy fields, plantations, and swamps into buildings, which has made the area prone to disasters, especially floods. Based on West Java Regional Disaster Management Authority data, there were eight flood events in Bekasi City during 2019-2021 2019 with 7,490 flood victims, 25 people displaced, and one school building lost. At the same time, there were 17 floods in 2020 with one death toll, 100035 flood victims, and 3648 displaced victims (West Java Regional Disaster Management Authority, n.d).

In 2021, there were nine incidents with eight deaths, 37,341 displaced people, and 79 families whose houses were submerged. Based on these data, the number of flood events during 2019-2021 in West Java tends to increase, and the losses incurred also increase. Community participation is very important when a disaster occurs, which includes families and community groups (Hidayati, 2008). For all groups and ages of the community, it is very important to prepare themselves and do first aid after a disaster, coordinate emergency response conditions, and evacuate from a disaster-affected area to a safe area (Jati and Priyana, 2013). In this case, adolescents have the lowest disaster response value among other age groups (Suharni & Kurniawan, 2021). Jatiasih is the sub-district with the most flood points every year for the last three years (2019-2021) in Bekasi City. Based on West Java Regional Disaster Management Authority for Bekasi city data, 13 floods occurred in Jati Asih District in 2019, 7 flood points in 2020, and in 2021, there will be six sub-districts affected by floods in Jati Asih, including Jati Rasa, Jatiasih, Jatisari Villages, Jati Noble, Jati Mekar, and Jati Kramat, with a total of

29,612 people affected and material losses of 7,403 houses and one public facility recorded as being affected by the floods. One of the public facilities affected by the floods in Jatiasih District is the school building. Fifteen junior high school buildings were affected by the floods (West Java Regional Disaster Management Authority, n.d). According to the preliminary study conducted by the researchers, the causes of the flooding that occurred in the research location disrupted teaching and learning activities, so students were forced to study from home due to high rainfall. The school and Bekasi City Regional Disaster Management Authority have carried out efforts to establish disaster preparedness for junior high school students through outreach and simulations.

Adolescents are part of the community, so it is important to increase knowledge, attitudes, and actions in dealing with disasters. The role of youth in predicting and dealing with disasters is considered very important. One of the roles of youth in dealing with a flood is emergency response, and youth are always involved in saving lives and property. In previous research, the youth level has high preparation for facing floods. Flood disaster risk education must start early; school age is one of the drivers of change, considering that floods are one of the disasters that often-hit schools. Teenagers at school must have good knowledge and attitudes to minimize the risks that may occur due to flooding. Efforts to increase disaster preparedness in the school environment are the focus of attention, which lies in stakeholders directly related to the education sector (Selvyana & Fitriani, 2021). Based on this background, the study aims to know on how knowledge, attitudes, and actions are related to flood disaster preparedness among junior high school students in Jatiasih District, Bekasi City, West Java.

METHOD

With a closed list of questions, the research method was quantitative and relies on survey/questionnaire activities. The quantitative approach is centered on questionnaire and survey activities, with a set of closed-ended questions. Quantitative data from survey or questionnaire findings, not based on the hypotheses of researchers or authors but rather from the outcomes of the respondents who have already been given the answers. This study employs the survey method for empirical research and collects information about the sample's subject matter using questionnaires, in-person interviews, and fieldwork documentation.

In this research, the researchers determined that the respondents were more random (random sampling) in the junior high school at Bekasi, Indonesia. Random sampling, also referred to as probability sampling, is a sample selection method in which each sample in the population has the same probability of being selected (Herdiansyah, 2019). While the sampling technique uses the formula from Riduwan (2009):

$$n = \frac{N}{Nd^2+1}$$

n = 5538
((5538) 〖 0.1 〗 ^2+1)
n = 98.3

Based on this formula, the number of samples obtained was 98.3 rounded up to 99.

RESULTS AND DISCUSSION

Variable Descriptive Knowledge of junior High School students

The distribution of data on the 99 respondents' responses to the 14 validly answered questions about their catastrophe knowledge related to floods is described in the description of the disaster knowledge variable. The average and % of the total score of the responses from respondents regarding how much they knew about floods are included in the data distribution. These findings allow for the description of the percentage of respondents' responses to the knowledge variable in Table 1.

Table 1. Descriptive knowledge

Knowledge	Frequency	Percent
Not enough	88	88.9%
Good	11	11.1%
Total	99	100.0%

Based on Table 1, most of the respondents (88.9%) had less flood disaster knowledge, while 11.1% had good flood disaster knowledge.

Descriptive Variable attitudes of junior high school students

The description of the disaster attitude variable outlines the distribution of information on the 99 respondents' responses to the 12 valid catastrophe attitudes about floods questions. The average and % of the total score of the respondents' responses regarding assessing attitudes toward flooding are included in the data distribution. These findings allow for a description of the percentage of respondents' responses to the attitude variable in Table 2.

Table 2. Descriptive attitudes

Attitude	Frequency	Percent
Not enough	89	89.9%
Good	10	10.1%
Total	99	100.0%

Based on Table 2, most respondents (89.9%) have a poor flood disaster attitude, while 10.1% have a good flood disaster attitude.

Descriptive Variable action of junior High School Students

The distribution of data on the 99 respondents' responses to the six validly answered questions about the catastrophe actions related to floods is described in the description of the disaster action variable. The average and % of the total score of the respondents' responses about measuring actions in relation to floods are included in the data distribution. Based on

these findings, the percentage of respondents' responses to the action variable in Table 3 can be explained.

Table 3. Descriptive action

Action	Frequency	Percent
not enough	38	38.4%
Good	61	61.6%
Total	99	100.0%

Based on Table 3, it can be seen that most of respondents (61.6%) had good flood disaster measures, while 38.4% had poor flood disaster measures.

Descriptive Variables of flood preparedness for Junior High School Students

The distribution of data on the 99 respondents' responses to the 12 questions about disaster attitudes toward floods that have been deemed legitimate is described in the description of disaster readiness variables. The average and a percentage of the total score for the respondents' responses regarding how to gauge flood preparedness are included in the data distribution. The percentage of respondents' responses to the preparation variable in Table 4 can be understood in light of these facts.

Table 4. Preparedness description

Preparedness	Frequency	Percent
Not enough	87	87.9%
Good	12	12.1%
Total	99	100.0%

Based on Table 4, it can be seen that most of respondents (87.9%) have less flood disaster preparedness, while 12.1% have good flood disaster preparedness.

Classic assumption test

The analysis to be used in this study is multiple regression analysis. To find out the results of multiple regression analysis in this study, normality tests, multicollinearity tests, and heteroscedasticity tests were carried out in Figure 1.

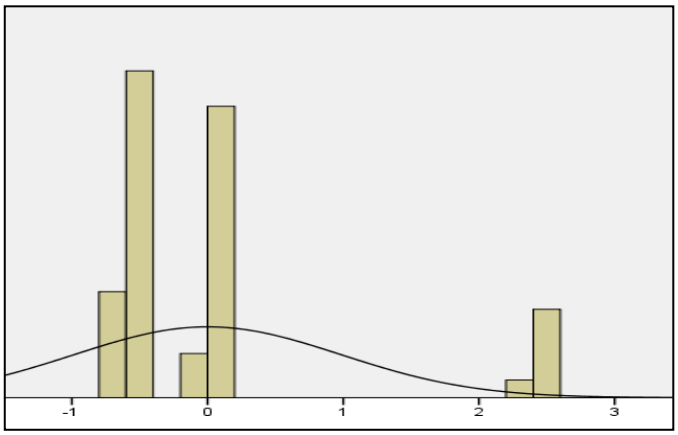

Figure 1. Normality histogram

In the data normality test, the data is normally distributed, which can be seen from the histogram shaped like a bell. Next is the multicollinearity test, as in Table 5.

Table 5. Coefficient of multicollinearity test

Model	*Collinearity Statistics*	
	Tolerance	VIF
Knowledge	,977	1.024
Attitude	,967	1.034
Action	,975	1.026

Based on Table 5, it can be concluded that there is no multicollinearity between independent variables. This is evidenced by the value of the Variance Inflation Factor (VIF) each of 1.024, which is smaller than 10; 1.034 < 10 and 1.026 < 10 so that it can be concluded that between the independent variables, there is no multicollinearity problem, so it is feasible to be used to analyze the results of the data. Next, do the heteroscedasticity test in Figure 2.

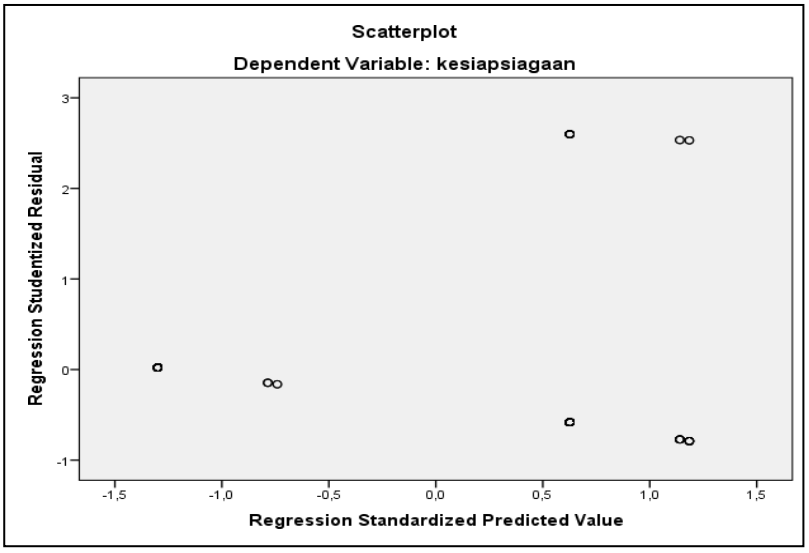

Figure 2. Heteroscedasticity test

Based on Figure 2, it can be concluded that the regression model is feasible to use to predict the preparedness of junior high school students in Jatiasih District in dealing with floods based on the input variables of disaster knowledge, attitudes, and actions.

Hypothesis testing and regression analysis

In this study, hypothesis testing was done to see how much the independent variables influenced the dependent variable, either partially or simultaneously, as well as to check the predetermined research hypotheses. In this study, an analysis was conducted to ascertain the impact of catastrophe knowledge, attitudes, and student behaviors on junior high school students' flood preparedness. The coefficient of determination is shown in Table 6.

Table 6. Summary Model [b]

Model	R	R Square	Adjusted R Square	std. Error of the Estimate
1	.300 [a]	.090	.061	.318

Based on the test results, it is known that the value of the coefficient of determination (R)2 of the model is 0.09, which indicates that the variables of knowledge, attitudes, and actions can explain flood disaster preparedness in junior high school students by 9% while other factors explain the rest.

Table 7. Hypothesis test

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	std. Error	Betas		
1	(Constant)	.698	.193		3.610	.000
	knowledge	.051	.103	.049	.493	.623
	attitude	.055	.108	.051	.511	.610
	action	.190	.067	.283	2.852	.005

a. Dependent Variable: preparedness

Table 7 shows that the t value for knowledge is 0.493, the t for attitude is 0.511, and action is 2.852. By the predetermined provisions, with the calculated t value of action = 2.852 greater than t table = 1.976, this regression model shows a partial influence between the disaster action variable (X) on the preparedness attitude variable (Y)

Then, it is also known that the significance value equals 0.005. By predetermined provisions, with a significance value of the action variable = 0.000 less than $\alpha = 0.05$, there is a significant influence between the disaster action variable (X) and the preparedness variable (Y). Therefore, based on the criteria for accepting and rejecting the existing hypothesis, namely, the calculated t value is more than the t table value and the significance value is less than the α value, it can be concluded that only disaster action variables positively affect preparedness.

This research was conducted by researchers at Junior High School students at Bekasi, which showed that the disaster actions of Junior High School students positively influenced flood disaster preparedness. This study also found that the variables of knowledge, attitudes, and actions together have an influence of 9% on flood preparedness. This research is in line with the study of Aprilin et al. (2018) concerning school preparedness for potential flood disasters at an elementary school at Gebangmalang, Mojoanyar District, Mojokerto Regency, with the results stating that the level of knowledge of teachers and parents at an elementary school at Gebangmalang, Mojoanyar District, Mojokerto Regency is categorized as good. Still, the action teacher preparedness is categorized as not ready, while the parents' preparedness actions are categorized as ready.

Increased knowledge is crucial for improving flood preparedness. According to the study (Tuladhar et al., 2015), individuals who had taken the course had the necessary skills and

exhibited readiness behavior. When people are in a potentially flood-prone area, knowledge of disaster management can help prevent physical and psychological effects on them, such as anxiety symptoms that can be felt, and help them evacuate quickly and act appropriately when the warning is given so that the impact occurring due to a disaster can be avoided (Kerstholt et al., 2017). The findings indicated that 63% of household heads were adequately prepared to deal with floods, highlighting the need for more community-based preparation information. According to research on the public's perceptions of floods and disaster preparedness conducted in Japan, some respondents who lacked sufficient knowledge about disaster preparedness expressed grave concerns about the risks posed by disasters that could strike suddenly and did not comprehend the precautions and efforts made to deal with floods. This explains why people are unprepared to handle calamities when they lack sufficient knowledge. His research in the Philippines supports that respondents' knowledge must be prepared before a disaster event to increase their knowledge and ability to deal with disasters through training and seminars (Mat Said et al., 2011).

However, some research has indicated that, under specific circumstances, greater awareness and information weakly positively correlate with the use of caution (Thieken et al., 2007; Miceli et al., 2008). According to Botzen et al. (2009), people's desire to spend money on sandbags is negatively correlated with their understanding about floods. When risk perception is taken into account, Lindell and Hwang (2008) find no evidence of a direct relationship between information sources and flood mitigation behavior. According to Siegrist and Gutscher (2008), "lack of knowledge about flooding" is not associated with less conduct related to mitigation. Similar findings were made by Zaleskiewicz et al. (2002) who discovered no discernible difference between respondents who purchased flood insurance and those who did not. These results suggest that knowledge is only sometimes a very useful predictor of flood mitigation behavior.

Behavioral models often use variables at the individual analysis level to predict preparation, such as risk perception and evaluation of the efficacy of potential actions (response efficacy) (Fitriani et al., 2019). The more individuals participate in their communities, the more they are prepared, and the greater use of social networks in enabling citizens' preparedness for risk (Najafi et al., 2015), according to a research of 629 Dutch inhabitants in The Hague in a region below sea level. Along with personality, observational learning, and prior experience, other information sources that may incite protection motivation were also taken into consideration. Protection motive is then seen as an intervening factor that awakens, maintains, and guides people's behavior in protecting themselves. Private flood mitigation behavior is

strongly influenced by an individual's ability to cope (Grothmann & Reusswig, 2006).

It is important to implement knowledge, attitude, and conduct towards disaster preparedness. In Lempake Village, the majority of household heads deal with flooding and typically feel modest worry. It might occur because the Lempake region has been deemed a catastrophe-resilient area and already has volunteer disaster workers. As a result, locals are prepared and equipped to deal with flooding (Halter, 2014).

CONCLUSION

Based on the research, the disaster actions of junior high school students in Bekasi positively influence flood disaster preparedness. In this study, it was also found that the variables of knowledge, attitudes, and actions together influence 9% of flood preparedness, while other factors influence the rest.

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