



Disaster Preparedness in Proximity of Merapi Volcano, Indonesia: Is There Any Relationship in Knowledge and Attitude of Senior High School Students?

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ABSTRACT

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Cangkringan District, Sleman Regency, Yogyakarta Province, Indonesia categorized as a volcanic disaster-prone area. In the study area, every student possesses knowledge and attitude toward volcano disaster preparedness since they have a high risk when Merapi Volcano erupts. The objectives of this study were to 1) find out the disaster knowledge attitudes and student preparedness in dealing with volcanic disasters and (2) find out the relationship between knowledge and student preparedness. This study uses a quantitative method of correlation with a questionnaire based filed survey. Data were processed using SPSS 21 In order to achieve the study objectives 120 students were intensively interviewed in two senior high schools, namely Senior High School 1 Pakem and Senior High School 1 Cangkringan, which are located in close proximity to Merapi Volcano Sleman Regency, Yogyakarta Province. The results showed that as many as 120 students, or 95% of the total research subjects, experienced a volcanic disaster. While the preparedness results obtained from the four main parameters, namely (1) Knowledge and attitudes, (2) Emergency response plans, (3) Disaster warning systems (4) Resource Mobilization, showed that 120 students were in the "Ready" category. The results of this study indicate a mismatch between aspects of knowledge and preparedness. The lack of transfer of disaster knowledge to students influences common disaster knowledge. It was found that, high preparedness has direct relationship with students' experiences, as they were directly affected by Merapi Volcanic disasters.

1. INTRODUCTION

Volcanic eruptions are one of the deadliest natural disasters that often occur in Indonesia. That's because this country has more than 130 active volcanoes. On the island of Java, there are 129 volcanoes [1]. The most active and dangerous is Merapi, which is located about 30 kilometers north of the city of Yogyakarta and is administratively located in two provinces, the Special Region of Yogyakarta and Central Java [2] major eruption of Merapi Volcano, recently these occurred in October and November 2010 which killed 339 people and destroyed at least 217 schools [3]. Preparedness for volcanic eruptions is essential because, with good preparedness, people can prepare themselves mentally and physically, reduce the risk of accidents, and increase their ability to deal with natural disasters [4]. In addition, preparedness can also assist in the process of evacuating and rescuing victims, as well as minimizing the long-term impacts that may occur after the natural disaster.

As a result, educational institutions located in high-risk zones near the Merapi Volcano must recognize and enhance the disaster preparedness abilities of their students lately, disaster readiness has garnered significant interest from scholars worldwide [5]. Preparedness is essential because effective preparedness is for survival, reducing injuries,

limiting property losses, and minimizing disturbances due to a disaster.

Disaster risk reduction is an effort to reduce threats and vulnerabilities and increase community capacity [6, 7]. That effort from the smallest layer of society, such as creating awareness of disaster resilience among the community [8, 9]. In addition, based on the research results [10], to enhance students' ability to survive in the event of a disaster, it is crucial to foster their knowledge and attitudes toward such occurrences. This positive correlation between disaster preparedness and understanding and attitudes emphasizes the necessity of incorporating disaster education into formal academic settings. Formal educational institutions play a principal role in promoting disaster awareness among students. Increasing knowledge and attitudes towards natural disasters can improve disaster preparedness, contributing to individual preparedness [11]. The Disaster Management Act of 2007, also known as Law Number 24, has shifted the focus of disaster management from handling disaster situations to diminishing and averting potential disaster risks, signifying a paradigm shift in the approach to disaster management [12].

Starting in 2006, the United Nations' International Strategy for Disaster Reduction (UN/ISDR) secretariat partnered with UNESCO to launch a campaign titled "Disaster Risk Reduction from Schools," which aimed to promote the

integration of disaster risk education into the academic syllabus in disaster-prone nations [13]. The Sendai Framework for Disaster Risk Reduction 2015-2030 recognizes the vital role of formal educational institutions, particularly schools, in reducing disaster risks. One of the key ways schools can contribute to this effort is by enhancing disaster preparedness, as emphasized in the framework [14]. The effectiveness of disaster preparedness efforts relies on community involvement and formal and informal educational institutions. Formal educational institutions such as schools play a crucial role in disaster preparedness, as they can help mitigate the impact of an impending disaster by enhancing preparedness measures [15]. Enhancing students' disaster preparedness is crucial in minimizing losses in educational institutions. As such, this study seeks to assess the level of disaster preparedness among high school students residing in areas near the hazardous Merapi Volcano. Additionally, this research investigates the correlation between students' disaster preparedness and their knowledge and attitudes toward disasters. It is expected that students' comprehension and outlooks toward volcanic eruptions will heighten their level of preparedness.

Disasters pose a severe threat at the global level, destroying educational centers, health, and transportation infrastructure and causing economic losses [16, 17]. Students in schools are vulnerable to a high risk of disaster [18] due to their lack of experience dealing with disasters. On the other hand, the locations of Senior High School 1 Pakem and Senior High School 1 Cangkringan are in three disaster-prone areas. Most students came from around Merapi Volcano, which impacted the Merapi eruption, and needed to gain experience with disasters in the local area [19]. Precautions are needed to anticipate losses and casualties among students.

Disaster management has an element of knowledge that is mandatory for people living in disaster-prone areas [20]. Disaster knowledge can raise awareness and understanding of disasters that occur in the local area. Each region has characteristics of disaster potential and vulnerability. Therefore, knowledge of disaster is an essential thing that is important to be prepared students. Knowledge has been recognized as an essential part of disaster management [21]. Disaster knowledge consists of several variables, including knowledge of the location of the incident, knowledge related to signs before a disaster occurs, knowledge of prevention and self-rescue, knowledge of evacuation routes, and knowledge of handling after a disaster occurs. Knowledge and the element of preparedness are also essential for everyone in dealing with disasters.

Discussion of disasters is only limited to issues that develop when major natural disasters occur; as stated by the study [22], after the disaster has passed, the issue of disaster content in the education curriculum has also passed without any significant progress. Whereas the delivery of disaster risk reduction knowledge in the curriculum can be innovatively integrated into existing subjects [23-25] that can assist students in understanding disaster knowledge.

Preparedness is mandatory for everyone included in pre-disaster activities [26, 27]. Advanced emergency preparedness and safety plans can reduce fatalities, injuries, and general disruption from disasters [28]. Preparedness is an effective strategy for preventing the impact of disasters that cause tremendous damage to life [29-31]. Preparedness is vital for students in tertiary institutions in disaster-prone areas. In measuring preparedness, it is necessary to use precise parameters and obtain the required data. Preparedness in

higher education is still very much needed to develop an understanding of the specific risks of disasters that threaten disaster areas [32]. It is crucial to implement preparedness for students in schools in disaster-prone areas. To correctly measure preparedness and obtain the necessary data, it is necessary to use the appropriate parameters.

Preparedness is essential for students in tertiary institutions in disaster-prone areas [33-35]. In measuring preparedness, it is necessary to use precise parameters and obtain the required data.

Preparedness parameters in this study consisted of Knowledge and Attitudes, Emergency Response Plans, Disaster Warning Systems, and Resource Mobilization [36]. Knowledge is the main factor in the formation of one's preparedness. Various natural disasters that have occurred provide lessons on the importance of disaster knowledge so that individuals have the right attitude in making decisions. Knowledge also determines attitudes to be more alert to disasters that will occur in the environment [37]. An emergency response plan is an integral part of preparedness intended for disaster emergencies related to evacuation and rescue can cause the loss of victims. Disaster management plans need to be prepared between individuals and organizations to be appropriate and improve disaster preparedness [38]. Disaster warning systems include warning signs, information distribution, and appropriate learning tools. So training or simulation is needed about what actions to take if you hear a disaster warning; go to the designated evacuation route to save yourself when a disaster occurs. Resource mobilization consists of resources such as human resources, funding, and infrastructure for disaster emergencies are crucial factors that support or conversely become obstacles in preparedness.

A number of related literatures [4, 21, 39-41] present research on disaster preparedness. The role of knowledge in disaster risk reduction [42]. Literature examining the relationship between knowledge and student preparedness in schools located in volcanic areas is still limited. Even so, there are several studies that discuss the relationship in disaster studies [4, 10, 35, 43] that are closely related and support the relationship research carried out. In addition, other studies [44] discuss preparedness for volcanic disasters in schools. Research the dangers of volcanic disasters by implementing active learning strategies [3, 45]. The literature identifies several weaknesses in disaster management preparedness [46, 47]. Based on the background and related literature, the study examines students' knowledge and preparedness in dealing with volcanic disasters in the Cangkringan sub-district, Sleman district in Yogyakarta Province, Indonesia. The reasons for the importance of this research are described in the formulation of the problem as follows: (1) To find out disaster knowledge and students' preparedness in dealing with volcanic disasters (2) To find out the relationship between knowledge attitudes and students' preparedness in dealing with Merapi Volcano. disaster emergency, Cangkringan sub-district, Sleman district in Yogyakarta Province, Indonesia. Gap research or important things in this study were carried out to fill the void by formulating the problems to be answered in the research, namely to find out the level of knowledge and attitudes of students in dealing with Merapi Volcano disasters and the relationship between knowledge and student preparedness in dealing with Merapi Volcano disasters in Cangkringan District, District Sleman in Yogyakarta Province, Indonesia. In short, it is hoped that the results of this

study will make a new contribution to understanding student preparedness in dealing with volcanic disasters and can become a reference for further studies in developing strategies to increase student preparedness in dealing with disasters in disaster-prone areas. This research is expected to make a new contribution to understanding student preparedness in dealing with Merapi Volcano disasters and can be a reference for further research in developing strategies to increase student preparedness in disaster-prone areas.

2. METHOD

This study uses a quantitative method with a correlation approach. The research locations include 2 senior high schools in Sleman district, Yogyakarta province. The location study area was selected because every year, an eruption of Merapi Volcano occurs, so it is considered as an essential to carry out preparedness research, specifically focusing on students at school level. This study measured students' disaster preparedness and knowledge in 2 senior high schools in Sleman district, and the relationship between selected variables and parameters. Disaster knowledge and preparedness has been categorized Table 1 and Table 2 as follows:

Table 1. Classification level of disaster knowledge

Index value	Category
67 – 100	Good
34 – 66	Sufficient
0 – 33	less

Source: [48]

Table 2. Classification level of disaster preparedness

Index value	Category
80 – 100	Very Ready
65 – 79	Ready
55 – 64	Almost Ready
40 - 63	Less Ready
0 – 39	Unready

Source:[49]

This research focuses on the preparedness of students to face volcano Merapi, which has been divided into five preparedness groups. Conducted in Sleman Regency, Special Region of Yogyakarta, Indonesia, this study focuses on two areas, namely Pakem and Cangkringan districts, with Senior Hight School 1 Pakem located at Latitude 7°39'30.33" South and Longitude 110°25'19.65"East, and senior high school 1 Cangkringan located at latitude 7°38'58.23"S and 110°26'0.40"East Longitude (Figure 1). The population under study is high school students who study Geography and disaster education in the Merapi Volcano disaster-prone areas in the two districts. Secondary data was obtained through analysis of Google maps, regional maps, and population data of Sleman Regency. Respondents were student representatives who lived and worked in the research location, selected

through random cluster sampling by considering the number of people living in the area.

2.1 Data collection

To collect data for this study, researchers utilized a questionnaire (Table 3) that served as a research instrument. The questionnaire incorporated the school community preparedness indicators for natural disasters developed by the Indonesian Institute of Sciences (LIPI) and UNESCO/ISDR to evaluate the level of student preparedness: 1) Knowledge and attitudes, 2) Emergency response plans, 3) Disaster warning systems, and 4) Resource mobilization [46]. The research employed a purposive sampling technique to select the participants. The students' disaster preparedness level was analyzed and evaluated using questionnaires and essays as research instruments based on the four indicators. The questionnaires were designed to measure students' attitudes toward disaster risk and their level of disaster preparedness. On the other hand, essays were utilized to measure students' knowledge about the Merapi Volcano natural disaster. The research instruments used are presented in the table below.

The data collection process was carried out by giving questionnaires to 120 students from three schools in the Cangkringan sub-district, Sleman district, Yogyakarta province, Indonesia. The questionnaire consists of three parts, namely knowledge, attitudes, and preparedness in dealing with volcanic disasters. The Likert scale was used to measure students' responses to each question in the questionnaire, with scores ranging from 1 to 4. In addition, an instrument in the form of essay questions was also given to measure students' knowledge of volcano disasters.

Before the instruments were used, developed through questionnaires and essay questions were examined and verified by learning experts (Table 4). The validity and reliability of the research instruments were also tested using the Pearson test and Cronbach's alpha to 25 respondents with a significant level of 5%. The correlation coefficient value of 0.396 indicates that the research instrument is valid. All instrument item items also met the validity criteria, indicated by each item having an r count value that is greater than the r table value. The reliability test results show that the preparedness instrument has a very high-reliability value, namely 0.961. Meanwhile, the reliability values of the knowledge and attitude instruments were 0.777 and 0.788, respectively, indicating that these instruments were also reliable and consistent in measuring the desired variable. The instrument used in this research is student preparedness in dealing with volcanic eruptions, to obtain preparedness data. for more information, please see Table 3 below.

Furthermore, to make it easier for the reader to detect the study areas of the two schools in this study, a research map with black dots is presented showing the sampling points in Figure 1 below.

While in Table 4 the instrument data per indicator is presented from the variables used in the research, namely the preparedness and attitude of students' knowledge in dealing with disasters.

Table 3. Instruments for student preparedness in facing volcano eruption disasters

Variable	Indicator	Question	
Preparedness	Knowledge and attitudes	<ul style="list-style-type: none"> • Definition of natural disaster • Type, source, magnitude, and location of natural disasters • Actions are taken in the event of a volcanic eruption 	23
	Emergency response plans	<ul style="list-style-type: none"> • Evacuation plan • Emergency response exercises and simulations 	6
	Disaster warning systems	<ul style="list-style-type: none"> • Recognize the warning signs of a disaster 	4
	Resource mobilization	<ul style="list-style-type: none"> • Human resources (student participation in disaster activities) 	3
Total		36	

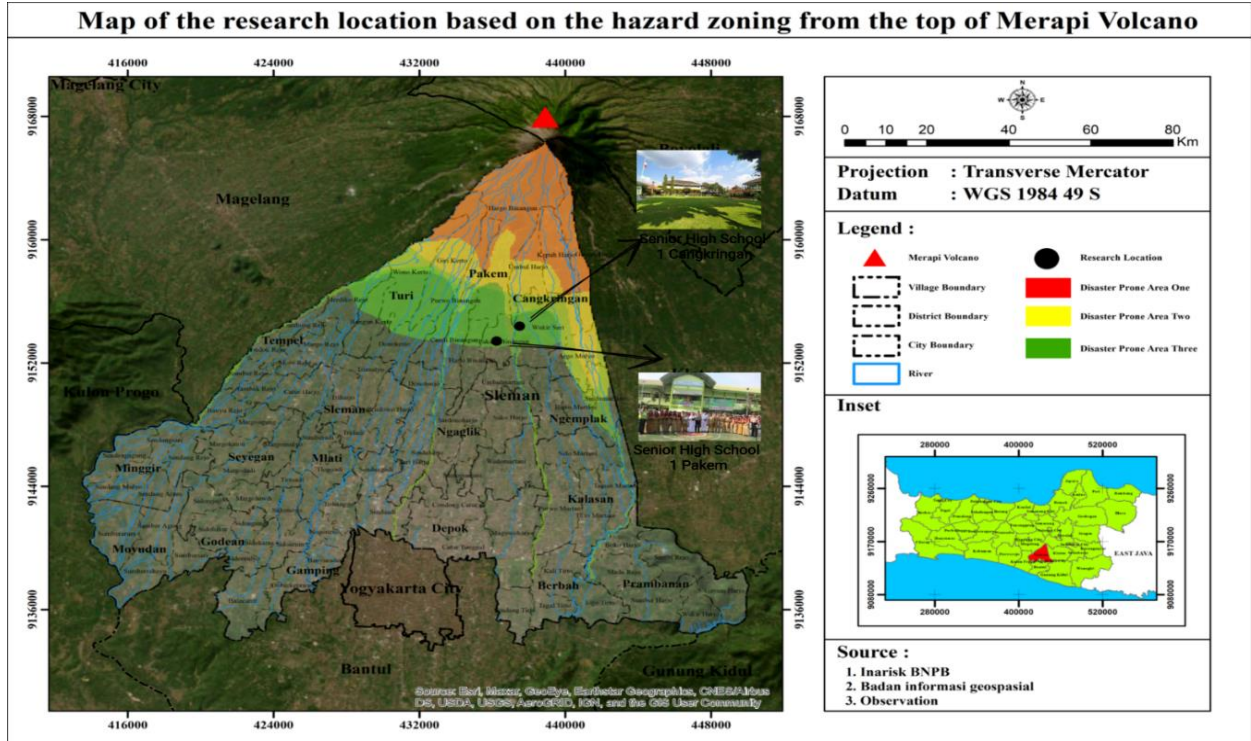


Figure 1. The study area of two schools with black dots indicating sampling points

Table 4. The main research questions for students

Readiness indicators	Research instrument
Knowledge and attitudes	1. Natural Disaster is a natural event that occurs suddenly or with a warning and causes losses in the form of material, property, and casualties
	2. a volcano activity that occurs inside the earth. Several processes and factors can trigger volcano activity and volcano eruptions.
	3. The cause of volcano eruptions is triggered by the interaction between several complex geological and hydrological factors and cannot be predicted accurately. Therefore, the community must be prepared and alert to the disasters caused by volcanoes.
	4. Volcano mud and ash: Mud and volcano ash scattered due to volcano eruptions can disrupt transportation and public health.
	5. Ash rain: Ash rain after a volcano eruption can cause health problems and worsen air quality.
	6. Eruption of toxic gases: Eruptions of toxic gases, such as sulfur dioxide and carbon dioxide, can cause disturbances to public health and endanger plants and animals.
	7. Follow information and warnings from local authorities: Pay attention to the information provided by local meteorological, geological and safety agencies regarding volcano conditions, evacuation warnings or instructions, and preparedness plans.
	8. Make an evacuation plan: Planning for evacuation before a disaster is wise. Ensure all family members and the evacuation team know the evacuation route and meeting point in case of separation.
	9. Prepare evacuation equipment: Prepare disaster response bags containing water, food, clothing, medicine, medical equipment and essential communication equipment.
	10. Participate in evacuation drills: Conduct regular evacuation drills and practice evacuation plans with family and neighbours.
Emergency response plans	1. Actionable Merapi Volcano disaster emergency response plan
	2. It is necessary to conduct emergency response drills and simulations regarding volcano disasters
	3. The dangers of volcano disasters need to be introduced to students
	4. A post-volcano disaster rehabilitation and reconstruction plan is required

Disaster warning systems	<ol style="list-style-type: none"> 1. Establishes a standard process, and the roles and responsibilities of all organizations that create and issue warnings, and are mandated by law 2. Establish protocols and inter-agency agreements to ensure consistent hazard warning and communication channels where different hazards are handled by different agencies 3. Rescue routes and evacuation directions must be owned in the school area and community environment 4. Testing and training of the warning system throughout the system is carried out at least once a year 5. Warning centres such as security posts need to be implemented in the community environment and guarded by the community or staff, either at night or around the clock 6. Save important/emergency numbers such as police station telephone numbers, hospital telephone numbers, BPBD telephone numbers, SAR telephone numbers and family telephone numbers/other emergency telephone numbers 7. Develop a disaster hazard map for Merapi Volcano in Sleman Regency 8. Need learning media, syllabus, modules, and textbooks that contain disaster material and student preparedness in dealing with Merapi Volcano disasters
Resource mobilization	<ol style="list-style-type: none"> 1. Students must be involved in preparedness measures to prevent risks due to disasters 2. Students together with teachers and related parties participate in socializing related to the Merapi Volcano disaster, as well as preparedness measures 3. Simulation and training for prevention and rescue actions against the Merapi Volcano disaster are carried out 1 year 2 times
Research instrument	
Disaster knowledge indicator	<ol style="list-style-type: none"> 1. Disasters can be known when they occur 2. Disasters can be prevented from occurring 3. It is necessary to carry out disaster preparedness and prevention training 4. Disaster education is necessary for students 5. Natural Disasters, Social Disasters, and Non-natural Disasters are types of Disasters

Source:[35]

2.2 Data analysis

In September 2022, a study was carried out using a quantitative questionnaire designed to adapt to the eruption of Merapi Volcano. This questionnaire was distributed to students in two schools affected by the eruption of Merapi Volcano in Yogyakarta Province to obtain feedback. This research is based on questions addressing knowledge and disaster preparedness, as well as the responses used to find the relationship between the two.

This study used a purposive sampling technique, namely a sampling technique with certain considerations for selecting universities and respondents. There were 120 high school student respondents from two schools that were sampled in this study. Yogyakarta Province was chosen as the research area because it often experiences and is affected by the eruption of Merapi Volcano every year. In addition, students in the two schools that were sampled also experienced the effects of the Merapi eruption. Data from the two variables were then analyzed using Pearson's bivariate correlation.

The level of student preparedness is measured using a composite index value per indicator. The index value per indicator is obtained from the total actual score of the indicator. The indicator scores were calculated as a percentage by dividing the total score achieved by the maximum possible score for each indicator, then multiplying by 100. The level of student preparedness was measured using a weighted composite index formula [49] which ranges from 0 to 100. The higher the index value, the higher the level of student disaster preparedness. The readiness levels were categorized into five groups: very ready (80-100), ready (65-79), almost ready (55-64), less ready (40-54), and not ready (0-39). The correlation between students' knowledge, attitudes, and readiness levels were analyzed using the Spearman rank correlation test, with a significant level (α) of 0.05. The data were analyzed using SPSS software version 21.

3. RESULTS

Disaster education in disaster risk reduction (DRR) in the school environment is a way to reduce the impact of disasters by increasing resilience [16], especially when students are in school buildings or locations. This study presents information about disaster knowledge and student preparedness in dealing with the Merapi Volcano disaster in Yogyakarta Province, Indonesia. This section will present the research results in several stages to answer questions about disaster knowledge and preparedness for high school students.

Respondents in this study were high school students entering the Merapi Volcano eruption hazard area who came from the Cangkringan sub-district, Sleman district in Yogyakarta Province. They were currently studying at two senior high schools, which were used as the research sample. Below will be described the number of students who have experienced and been affected by the volcano disaster.

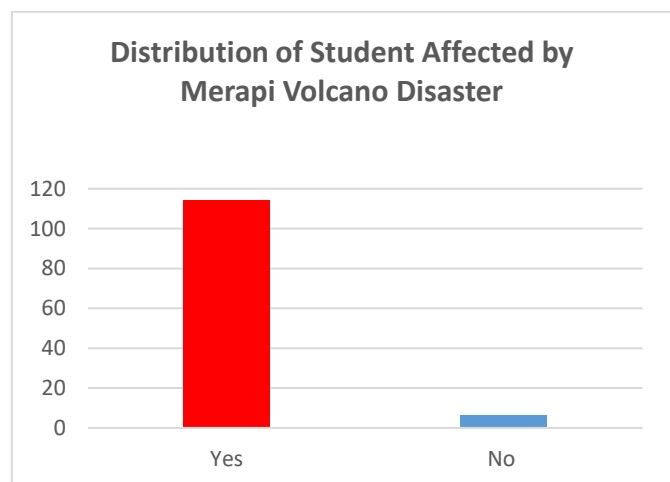


Figure 2. Number of respondents affected by Merapi Volcano in Cangkringan sub-district, Sleman Regency, Yogyakarta Province

Figure 2 shows that of the total number of respondents, namely high school students, as many as 95% or 114 people have experienced and been affected by forest and land fires, while only six people were not in a volcano disaster-prone zone. This research was conducted in November 2022 using a quantitative questionnaire designed according to field conditions to evaluate students' knowledge and preparedness in dealing with the Merapi Volcano disasters. The parameters of student preparedness in dealing with disasters consist of four aspects, namely (1) knowledge and attitudes, (2) emergency response plans, (3) early warning systems, and (4) resource mobilization. In addition, this study also examines students' knowledge of disasters.

After obtaining the data, the next step is to analyze data using the SPSS version 21 program. In addition, a correlation test will be carried out to understand better the relationship between knowledge and student preparedness in dealing with the Merapi Volcano disasters. Data will be categorized into various preparedness groups during the research process and analyzed statistically.

3.1 Knowledge of disaster

Knowledge is helpful for individuals or groups seeking to improve survival. It has been conveyed that disaster preparedness must be owned by every individual as a bull for themselves to save themselves [50]. Explains that disaster preparedness is the knowledge and skills developed by the government, organizations, or related institutions to anticipate and respond to the impact of hazardous events or conditions caused by disasters. Knowledge about disasters is an essential basic need and must be provided as early as possible so that people are prepared to face the threat of disasters that may occur in their area. Because each region has different vulnerabilities, potentials, and threats to disasters, disaster knowledge must be categorized into three categories: very understand, understand, and not understand.

Below will be presented the results of students' disaster knowledge from two schools in disaster-prone areas of three volcano eruptions in the Cangkringan sub-district, Sleman Regency, Yogyakarta Province, Indonesia.

Based on Table 5 knowledge of disaster attitudes, there are three groups of students with knowledge of disaster, most of them are in the 'good' category, as much as 64% then 30% have sufficient knowledge of disaster, meanwhile with knowledge of less than 6%. For security reasons, individual students need to be taught and given an understanding of disasters through learning in class and the field because the area of residence and the location of the school is in a disaster hazard area where a volcano eruption occurs, which has an impact on Cangkringan sub-district, Sleman Regency, Yogyakarta province.

Table 6 presents the assessment of high school student's preparedness in areas prone to disasters caused by Merapi Volcano, using four indicators: knowledge and attitudes, disaster emergency response plans, disaster warning systems,

and resource mobilization. According to Table 6, all the measured indicators of student readiness scored within the "ready" category with an index value of 65.84. Therefore, the results suggest that high school students in disaster-prone areas of Merapi Volcano are categorized as "ready" in terms of their level of preparedness based on the four disaster preparedness indicators.

Indicators of knowledge and attitude are crucial in enhancing students' readiness, as revealed by research findings. Although the index value ranks second among the four indicators examined, more respondents in the prepared category demonstrate positive knowledge and attitude indicators than the other indicators [51] which states that students' knowledge and preparedness significantly affect preparedness.

Table 5. Categories of disaster knowledge

Index Value	Category	Student	Percentage
67 – 100	Good	77	64,2
34 – 66	Sufficient	36	30
0 – 33	less	7	5,8
	Sum	120	100

$$\begin{aligned}
 \text{Preparedness Composite index} &= \left(\frac{\text{real weight KA}}{\text{max weight}} \times \text{Index K} \right) \\
 &+ \left(\frac{\text{real weight EP}}{\text{max weight}} \times \text{Index EP} \right) + \left(\frac{\text{real weight ws}}{\text{max weight}} \times \text{Index WS} \right) \\
 &+ \left(\frac{\text{real weight RMC}}{\text{max weight}} \times \text{Index RMC} \right)
 \end{aligned}$$

$$\begin{aligned}
 \text{Preparedness Composite index} &= \left(\frac{10}{25} \times 67 \right) + \left(\frac{4}{25} \times 72 \right) + \left(\frac{8}{25} \times \right. \\
 &62) + \left(\frac{3}{25} \times 64 \right) = 26,8 + 11,52 + 19,84 + 7,68 \\
 &= 65,84
 \end{aligned}$$

3.2 Relationship between knowledge and preparedness

Students with good computer and internet skills tend to increase their knowledge and attitudes [52]. The relationship between knowledge and student preparedness in Cangkringan District, Sleman Regency, Yogyakarta Province, Indonesia, was tested using the Spearman correlation test to determine the relationship between student preparedness and disaster knowledge in senior high school students. The location of Senior High School 1 Pakem and Senior High School 1 Cangkringan, which is in an area prone to Merapi Volcano, requires every individual to be alert because disasters can occur without notification. Below is a table of analysis of the relationship between knowledge and high school students' preparedness in dealing with the Merapi Volcano disaster in Cangkringan District, Sleman Regency in Yogyakarta Province. Data in Table 6 and Table 7 respectively show the results of research on student preparedness in dealing with disasters and the relationship between preparedness and the knowledge possessed by students.

Table 6. Student preparedness for Merapi Volcano eruption

Preparedness Category	Very Ready	Ready	Almost Ready	Not Ready	Less Ready	Total	Category Parameter Index	Category
Knowledge and attitudes	27	22	36	15	20	120	67	Ready
Emergency response plans	23	27	13	29	28	120	72	Ready
Disaster warning	18	17	12	32	41	120	62	Almost

systems									Ready
Resource mobilization	0	43	0	77	0	120	64		Almost
									Ready
							65,84		Ready

Table 7. Correlation between knowledge and preparedness

		Preparedness	Knowledge
Knowledge	Pearson Correlation	1	.220*
	Sig. (2-tailed)		.016
	N	120	120
Preparedness	Pearson Correlation	.220*	1
	Sig. (2-tailed)	.016	
	N	120	120

*. Correlation is significant at the 0.05 level (2-tailed).

Based on the analysis results presented in Table 7, the sig. (2-tailed) value is 0.016, so there is a positive relationship between knowledge and Preparedness in the Merapi Volcano disaster area in Sleman Regency, Yogyakarta Province, Indonesia. However, the relationship between knowledge and Preparedness is low. The relationship shows that the knowledge students possess regarding the actions or behaviour of Preparedness in the face of disasters can be supported by other factors. In other words, increasing student preparedness is not only by providing knowledge-related material. However, it can be strengthened by providing training, preparedness simulations, or disaster-related meetings, so students are always ready.

4. DISCUSSION

The Preparedness Index for students facing the Merapi Volcano disaster in two schools, namely Senior High School 1 Pakem and Senior High School 1 Cangkringan, is included in the ready category after being measured based on the Preparedness parameter, which contains four leading indicators, namely Knowledge and Attitude, Emergency Response Plan, Disaster Warning System and Resource Mobilization Power. Before data collection was carried out, high school students were first given topics for learning about disaster material, disaster preparedness and material about Merapi Volcano in Yogyakarta province in particular. Formal educational institutions such as schools undoubtedly play a vital role in enhancing students' awareness and knowledge of Preparedness. The application of disaster risk education to the school curriculum aligns with research [53], which has increased student preparedness for disasters. It is imperative to have indicators that can assess students' knowledge and attitudes in increasing their Preparedness for disasters because this allows students to adapt to situations that occur and increase their knowledge to deal with disasters [54].

Students' Preparedness in dealing with disasters needs to be improved to reach the "Very Prepared" category because, for now, their Preparedness is still at the lower limit in the "Ready" category, namely 65.84. Knowledge of disaster and student preparedness in dealing with disasters is still minimal and yet to be supported by material and media. Hence, students need more awareness even though the school's location is in a dangerous area 3 volcano eruptions.

Individuals, particularly students, who possess excellent knowledge about natural disasters are more likely to enhance their readiness to cope with such events. Furthermore, it is consistent with the notion that knowledge is the primary factor

to consider when enhancing disaster preparedness [55]. Disaster knowledge is the main factor of Student Preparedness [36] dealing with Merapi Volcano disasters which has also been used as the primary indicator in measuring individual and community Preparedness. Formal educational institutions are essential in building students' knowledge about natural disasters through disaster learning. Research conducted [56] also conveys that students who receive disaster topics in class can increase their knowledge about disasters. Therefore, for institutions and governments to demonstrate their commitment to improving students' knowledge and attitudes in dealing with disasters, they must mandate disaster-focused education to promote readiness on an individual level.

Knowledge and attitudes of students towards natural disasters are the main factors that must be considered in improving disaster preparedness [53]. In line with the previous statement, [4, 35] the relationship between disaster preparedness and knowledge is very close, if knowledge is high, disaster preparedness is also high, and vice versa. Therefore, formal educational institutions need to build students' knowledge about natural disasters through disaster learning. Implementation of disaster risk education into the curriculum in schools is very important to increase student preparedness for disasters. This is also in line with previous research. In this case, the role of institutions and government is very important in providing an understanding of students' knowledge and attitudes in dealing with disasters. Therefore, learning that is oriented towards disaster education must be mandatory so that everyone's preparedness can increase.

Recommendations are addressed to related parties such as educational institutions, regional governments and local communities regarding actions that can be taken to increase preparedness in dealing with Merapi Volcano disasters. Managerial implications can also be in the form of recommendations regarding the development of disaster curricula in schools, disaster preparedness training for local communities, and the development of more effective early warning systems. Thus, emphasizing managerial implications is very important to ensure that research results can make a real contribution in increasing disaster preparedness in the Merapi Volcano area.

5. CONCLUSIONS

The results of this study indicate that knowledge and Preparedness have a positive and independent relationship with one another. It has been explained that the Preparedness of high school students, who incidentally are human beings with more advanced thinking than children, can take a stand

by conducting simulations and training to increase their Preparedness in dealing with the Merapi Volcano disaster.

The Preparedness Index of students in two schools in a volcano disaster is included in the "Ready" category. However, it is at the lower limit, so action and efforts are needed to increase Merapi Volcano Disaster Preparedness.

The conclusion of this research can make an important contribution to expanding the understanding of the factors that influence preparedness in dealing with natural disasters. The results also show that although the index of student preparedness in two schools located in the disaster area of Merapi Volcano is included in the "Ready" category, it is still at the lower limit. Therefore, more intensive actions and efforts are needed to increase student preparedness in dealing with Merapi Volcano disasters, such as training and simulations of Merapi Volcano disasters. In this way, the capacity, knowledge, and attitude of students can be improved, so that they are better prepared to face future disasters of Merapi Volcano.

Overall, this study provides new insights into preparedness in dealing with Merapi Volcano disasters for high school students. It is hoped that the results of this research can provide a valuable contribution to efforts to increase community preparedness in dealing with natural disasters in the future.

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