

Original Research

# An Overview of Junior High School Students' Knowledge and Preparedness in Facing Natural Disasters



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Article Info	Abstract
Article history: Received: 27 May 2024 Accepted: 15 July 2024	<p><i>Introduction:</i> Glagah is one of the districts in Lamongan Regency with a high potential for natural disasters such as floods, tornadoes, droughts, and forest fires. To reduce the impact of disasters, disaster mitigation is required. On the other hand, students are a vulnerable group to natural disasters. Before disaster mitigation is carried out, it is necessary to initially identify students' level of disaster knowledge and preparedness. The purpose of the study was to determine students' knowledge and preparedness in facing natural disasters.</p> <p><i>Methods:</i> The study used descriptive quantitative research with a sample of 310 junior high school students in Glagah District who were obtained using a two-stage cluster random sampling technique on March 6-10, 2024. The data were collected using a questionnaire on knowledge and preparedness for floods, tornadoes, and fires, and then analyzed descriptively.</p> <p><i>Results:</i> The results indicated that students' knowledge in dealing with floods, tornadoes, and fires was in the "good" category (96.5%; 87.4%; 71.6%). Students were in the "prepared" category for floods and fires (62.6%; 49.7%), and in the "very prepared" category for tornadoes (48.7%).</p> <p><i>Conclusion:</i> Students demonstrated the best knowledge in flood and fire disasters. Students were in the "very prepared" category in tornado disasters, and in the "prepared" category in floods and fires. It is recommended that future researchers can conduct interventions to improve student preparedness in all types of natural disasters and identify students' knowledge and preparedness in dealing with earthquake disasters.</p>
Keywords: knowledge, disaster-planning, natural-disaster	

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## INTRODUCTION

Indonesia is well-known as a disaster-prone country. The World Risk Report 2022 states that Indonesia is the third most disaster-prone country in the world [1]. Approximately 13% of the world's volcanoes within the Indonesian archipelago have the potential to cause natural disasters of varying intensity and strength [2]. Indonesia's geographical location at the confluence of two plates and continents makes it highly vulnerable to earthquakes and tsunamis. The equatorial position of Indonesia gives it a tropical climate with high rainfall, making the country vulnerable to floods and landslides [3].

In 2014-2023, Indonesia experienced 29,329 disasters consisting of 39.7% (11,648) hydrometeorological disasters such as floods, droughts, tornadoes, forest and land fires, landslides, floods and landslides, and abrasion and about 60.3% (17,681) geological disasters including earthquakes, tsunamis, earthquakes and tsunamis, and volcanic eruptions. In East Java, there were 3,427 disasters consisting of 98% (3,368) hydrometeorological disasters and 2% (59) geological disasters. Furthermore, in Lamongan regency, there were 51 hydrometeorological disasters, including floods, landslides, tornadoes, and droughts [4].

An individual's knowledge can influence his or her attitude and concern for disaster preparedness [5]. Early knowledge of disasters and mitigation can provide an understanding and direction regarding the steps needed in case of a threat in the

environment [6]. The National Disaster Management Agency (BNPb) runs a Disaster Safe Education Unit (SPAB) program to improve disaster mitigation and education for students and school officials in disaster-prone areas. This program is expected to create a resilient school, which can then be disseminated to nearby schools, families, and communities around the school to better understand and improve disaster preparedness [7].

One factor to reduce the impact of disasters is mitigation. Mitigation is part of preventing casualties. Prevention can be achieved by strengthening knowledge and preparedness. Several factors affect knowledge and preparedness including education, attitudes, gender, age, previous disaster experiences [8]. Disaster management is a series of activities covering the establishment of development policies at risk of causing disasters, disaster prevention activities, emergency response, and rehabilitation [9]. Lack of knowledge and preparedness can lead to loss of life, serious injuries, displacement, and disease due to poor environmental conditions [10]. An attempt to increase knowledge and disaster preparedness in students is to conduct disaster preparedness training [11]. The results of previous research indicated that the disaster preparedness knowledge of SMPN 3 Kuta Selatan Badung students was in the good category which was affected by students' experience in facing disasters [12]. Law No. 24 of 2007 on Disaster Management states that vulnerable groups consist of infants, children, pregnant or breastfeeding mothers, people with disabilities and the elderly. Students are

included as one of the vulnerable groups in disasters because their age is unprepared for disasters [13].

Based on preliminary studies conducted at the Lamongan Regional Disaster Management Agency (BPBD), it was revealed that one of the districts in Lamongan Regency with a high potential for natural disasters such as floods, extreme weather, forest and land fires is Glagah. In 2019-2022, Glagah experienced one strong wind, one flood, and 3 tornadoes. Furthermore, strong winds caused 1 house to suffer minor damage, while floods caused damage to a number of houses, land, public facilities such as secondary schools which were submerged in water up to 30-40 cm. The tornado caused 671 houses to be slightly to severely damaged, public facilities were moderately to severely damaged, and 1 secondary school building was severely damaged. From teacher interviews at each junior high school in Glagah district, students did not receive disaster mitigation education and training, making it possible that students' knowledge and preparedness were still low.

Before conducting interventions to improve students' knowledge and preparedness, it is necessary to first identify the current condition of students' knowledge and preparedness. Therefore, this research aimed to identify the knowledge and preparedness of junior high school students in Glagah district in facing natural disasters.

## **METHODS**

### ***Design and Settings***

This was a descriptive quantitative study. The research variables were knowledge and preparedness. The research was conducted

from March 6 to 10, 2024, at some junior high schools in Glagah District consisting of 10 schools including SMP Hasyim Asy'ari, SMP Negeri 1 Glagah, SMP Wahid Hasyim, MTs N 2 Lamongan, MTs Al Azhar, MTs Al Hidayah Wedoro, MTs Assa'adah, MTs Bustanul Ulum, MTs Muhammadiyah 10 Wukir, dan MTs Tarbiyatul Wathon.

### ***Samples***

The population in this study were junior high school students in Glagah District, totaling 1,336 students. The research sample amounted to 310 students which was determined based on the Slovin formula with  $\alpha = 0.05$ . The sample was selected by using two-stage cluster random sampling (Cluster and stratified random sampling).

The inclusion criteria were 7th, 8th, and 9th grade junior high school students in Glagah District who were willing to become respondents. The exclusion criteria were junior high school students who could not read, and or were disabled (blind, deaf, speech impaired), and students who were absent from school during the study.

### ***Instrument***

The research instrument utilized 2 types of closed questionnaires, specifically knowledge and preparedness questionnaires for natural disasters including floods, tornadoes, and fires, each containing 10 questions. The questionnaire was prepared by the researcher with validity and reliability tests conducted on 10 junior high school students in another district. The results of the questionnaire validity test showed that all knowledge questionnaires were valid ( $r > 0.523$ ;  $r > 0.523$ ;  $r > 0.605$ ) and reliable

(Alpha-Cronbach  $\alpha=0.843$ ;  $\alpha=0.831$ ;  $\alpha=0.898$ ). Knowledge level was categorized into 3 categories: good (score >75%), fair (score 56-75%), and poor (score <56%). The results of the validity test of the preparedness questionnaire indicated that all preparedness questionnaires were valid ( $r>0.520$ ;  $r>0.561$ ;  $r>0.529$ ) and reliable (Alpha-Cronbach  $\alpha=0.880$ ;  $\alpha=0.914$ ;  $\alpha=0.815$ ). The level of preparedness was categorized into 5 categories, namely very ready (score 80-100), ready (score 65-79), almost ready (score 55-64), less ready (score 40-54) and not ready (score 0-39).

**Procedures**

This study was conducted for 5 consecutive days, 1 to 3 schools per day. The researchers asked each school for a list of student names, then selected students who met the inclusion criteria and excluded students with exclusion criteria.

The list of names was randomly selected from students with even numbered

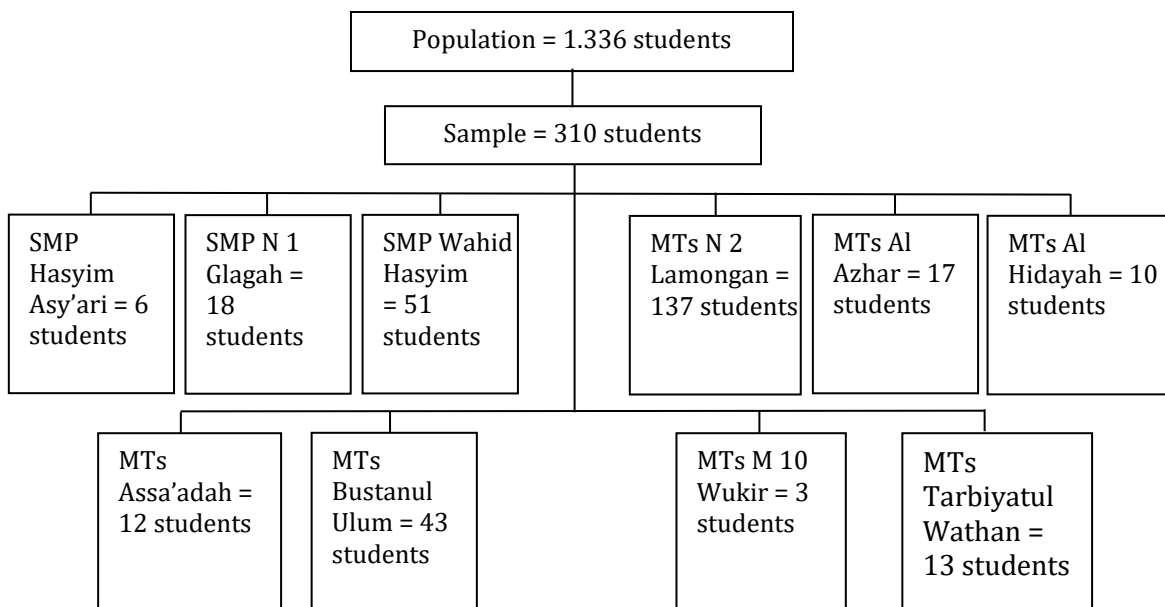
attendance. The selected students were gathered in one room by the school. If the selected students were not present at school, then they were replaced with another student with even attendance. Furthermore, the students were given an explanation about the research. If the students were willing to be the respondents, they were given a consent form to sign and then distributed paper questionnaires. The filled questionnaires were then checked for completeness of answers before being analyzed.

**Data Analysis**

The data were tabulated and scored and then analyzed descriptively using the Statistical Package for the Social Sciences (SPSS).

**Ethical Clearance**

This research has been declared ethically feasible by the Ethics Committee of Muhammadiyah University Lamongan on March 05, 2024 with No. 028 /EC /KEPK -S1 / 03 /2024.



**Fig. 1.** Cluster Random Sampling

## RESULTS

The total number of students involved in this study was 310 students consisting of 55.2% females and 44.8% males. There was 1 randomly selected student who was absent and then randomized again to complete the target sample size.

Table 1 shows the age of respondents in the range of 12-16 years, of which 34.2% are 14 years old which is divided equally per class

of 33.2-33.5%, and 44.1% of respondents are students of MTs Negeri 2 Lamongan.

Table 2 demonstrates that 96.5% of students have good knowledge in flood, 71.6% of students have good knowledge in tornado, and 87.4% of students have good knowledge in fire.

Table 3 indicates that 66.6% of students are prepared for floods, 48.7% of students are prepared for tornadoes, and 49.7% of students are prepared for fires.

**Table 1**

Demographic Data (N=310)

Variable		N	(%)
Age	12 years	52	16.8
	13 years	101	32.6
	14 years	106	34.2
	15 years	46	14.8
	16 years	5	1.6
	Total	310	100.0
Gender	Male	139	44,8
	Female	171	55,2
	Total	310	100.0
Grade	7	104	33,5
	8	103	33,2
	9	103	33,2
	Total	310	100.0
School	SMP Hasyim Asy'ari	6	1,9
	SMP Negeri 1 Glagah	18	5,8
	SMP Wahid Hasyim	51	16,5
	MTs Negeri 2 Lamongan	137	44,1
	MTs Al Azhar	17	5,5
	MTs Al Hidayah	10	3,2
	MTs Assa'adah	12	3,9
	MTs Bustanul Ulum	43	13,9
	MTs Muhammadiyah 10 Wukir	3	1,0
	MTs Tarbiyatul Wathon	13	4,2
	Total	310	100.0

**Table 2**

Students' level of knowledge in facing natural disasters (N=310)

<i>Natural Disaster</i>	<b>Knowledge</b>	<b>N</b>	<b>(%)</b>
Flood	Good	299	96.5
	Fair	8	2.6
	Poor	3	1.0
	N	310	100.0
Tornado	Good	222	71.6
	Fair	83	26.8
	Poor	4	1.6
	N	310	100.0
Fire	Good	271	87.4
	Fair	35	11.3
	Poor	4	1.3
	N	310	100.0

**Table 3**

Students' level of preparedness in facing natural disasters (N=310)

<i>Natural Disaster</i>	<b>Preparedness</b>	<b>N</b>	<b>(%)</b>
Flood	Very prepared	103	33.2
	Prepared	194	62.6
	Almost prepared	12	3.9
	Less prepared	1	0.3
	Unprepared	0	0
	Total	310	100.0
Tornado	Very prepared	151	48.7
	Prepared	147	47.4
	Almost prepared	6	1.9
	Less prepared	4	1.3
	Unprepared	2	0.6
	Total	310	100.0
Fire	Very prepared	7	2.3
	Prepared	154	49.7
	Almost prepared	140	45.2
	Less prepared	8	2.6
	Unprepared	1	0.3
	Total	310	100.0

**DISCUSSION**

According to Green, behavior related to health is influenced by two main factors, internal and external factors behavior [10]. Then, it is shaped by three factors: 1) factors

predisposition includes age, type of gender, education, occupation, knowledge, and attitude. 2) factors enablers include quality service, mileage, attitude officers 3) reinforcing factors include officers or cadres, family [11].

More than half of the respondents, 41 people (51.3%) had a fair level of knowledge. A small percentage of 18 people (22.5%) had a low level of knowledge. Knowledge is what arises when someone does something sensing an object, and this is the result of knowing someone [6]. Knowledge is the basis for influencing an action or behavior. Knowledge is one of the factors that influences the formation of attitudes of somebody [12]. Education and knowledge are important things for humans, who can change perceptions about something. The higher a person's education, the easier it is to receive information that plays a role in a person's behavior[10]. The mother's knowledge greatly influences the mother's behavior when attending visits to posyandu with her child. Health education, as part of public health, functions as a medium or means to provide socio-psychological conditions in such a way that individuals or communities behave following the norms of healthy living. In other words, health education aims to change the knowledge, attitudes, and actions of individuals or communities. So that it complies with healthy living norms. Health education will influence health behavior, and then health behavior will influence increasing public health indicators as an outcome of health education [12] Good knowledge will contribute to good attitudes and behavior. The majority of respondents have good knowledge, supported by their productive age range and education level.

The attitude variable showed that more than half of the respondents, 52 people (65%), have a fair attitude, and five respondents (6.3%) have a good attitude. Behavior is

formed by three factors, one of which is predisposing factors, which include knowledge, attitudes, beliefs, beliefs, and values that are not good regarding understanding of posyandu [7]. Attitude is a driving factor in creating behavior.

In the utilization variable, it appears that the majority of respondents (53.8%) have a good level of utilization of KIA books. Posyandu is a communication forum for technology transfer in health services carried out by the community. Posyandu is a meeting point between professional services from health workers and community participation in overcoming public health problems. As one of the most important targets, toddlers can be an indicator of the community's level of use of posyandu. It is stated that there is a significant relationship between family support and toddlers' visiting behavior at posyandu [8]. Utilization of posyandu services is a crucial element in efforts to improve public health.

Knowledge is a very important domain for the formation of a person's behavior. There is a significant relationship between knowledge about posyandu and the mother's behavior in using posyandu. Knowledge will form attitudes as the basis for creating behavior [12]. Other sources stated that the lack of public knowledge about health services at Posyandu greatly influences the intensity of visits to Posyandu [13]. Age and education are factors that influence knowledge and thus influence the behavior of visiting posyandu for toddlers. At a mature age, it is easy to receive and digest the information that is obtained, as well as with a good education the breadth of knowledge is obtained so that someone who knows accepts

the information and can apply it in his life[13]. Knowledge has a strong relationship as a predisposing factor for utilization behavior. This is thought to be related to age, education level, and the respondent's exposure to information.

It was found that the higher the mother's attitude and knowledge, the more significant it would comply with coming to Posyandu [14]. This is in contrast to Neni's (2022) research that there is no connection between attitude and posyandu utilization. Respondents may agree with Posyandu services, but they have not taken any action. Motivating respondents in the form of regular assistance can increase posyandu visits [15]. Attitudes might contribute to behavior, but it seems that they must be supported by other factors, such as mentoring and motivation.

The lack of public knowledge about health services at Posyandu greatly influences the intensity of visits. knowledge is one of the predisposing factors of a person's behavior, so that is people's knowledge of [16]. If the Posyandu is lacking, the person's behavior will also be the same as their level of knowledge. Good knowledge can also be influenced by education. The higher a person's education, the better their knowledge about the benefits of their toddler posyandu [17]. In other literature, it is stated that mothers' attitudes and beliefs towards posyandu, posyandu facilities, cadre services, and Geographical factors are thought to be several other factors that contribute to posyandu utilizations [18]. The role of cadres is thought to be a very important domain in shaping a person's behavior or actions. The role of posyandu cadres can be increased by

providing counseling and information regarding the benefits of posyandu and providing motivation to play an active role [19]. Knowledge and attitudes play a role in a person's behavior, including visits to Posyandu[20]. Knowledge can have a direct impact on the utilization of posyandu. On the other hand, attitude acts as a supporting variable along with other factors such as geographical conditions, the role of cadres, motivation, and information.

### ***Nursing implications***

The research results highlight the analysis of knowledge, attitude, and utilization of KIA books in recognizing signs and symptoms of emergency in pregnancy, which have significant implications for nursing practice. Understanding the gaps in knowledge and attitude towards utilizing resources such as KIA books can guide nurses in designing targeted interventions to improve maternal health outcomes. By addressing these findings, nurses can enhance education efforts, promote evidence-based practices, and ultimately contribute to better emergency care for pregnant individuals.

### **CONCLUSION**

Knowledge has a simultaneous influence on the use of KIA books utilization on posyandu regarding emergency signs and symptoms in pregnancy. Attitudes influence the use of KIA books in posyandu. Good knowledge will encourage better health attitudes and behavior. Attitudes contribute to behavior, but it seems that they must be supported by other factors, such as mentoring and

motivation. The study limitation was a short period of data collection time and a relatively small number of respondents. It suggested involving a bigger sample and longer data collection time for future research.

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