

Knowledge of School Residents' on Self-Evacuation of Natural Disaster Victims at SMP Negeri 1 Botupingge

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ABSTRACT

Introduction: Natural disasters can cause significant losses to life, the environment, and the economy. In the past decade, Gorontalo Province recorded 169 disasters. Schools play a crucial role in disaster management through risk education, evacuation drills, and community protection. This study assesses the knowledge of self-evacuation procedures among school residents at SMP 1 Botupingge. The findings will help develop better educational programs to enhance school and community disaster preparedness.

Method: This quantitative descriptive study involved 313 individuals, with final sample size 63 selected through accidental sampling. Data were collected using a validated questionnaire and analyzed with univariate tests.

Results: Most respondents had "good" category knowledge of self-evacuation (55.6%), followed by "sufficient" category (41.3%) and "insufficient" category (3.1%).

Conclusion: The majority of SMP Negeri 1 Botupingge residents mostly demonstrate good self-evacuation knowledge. Regular simulations and training are recommended to strengthen disaster preparedness.

Key words: Disaster planning, knowledge, natural disasters, self evacuation



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Introduction

Natural disasters are unexpected events that can cause significant losses to human life, the environment and the economy. These disaster have highly detrimental impacts on various parties, necessitating swift and appropriate actions to reduce risks and protect communities affected by such events.¹ One of the strategies to address this is independent evacuation of disaster victims. Globally, the number of fatalities due to natural disasters varies significantly yearly. More than 200,000 deaths have been attributed to global disasters, accounting for over 0.4% of total fatalities. On a global scale, the death toll in 2023 alone reached 62,162.²

Based on data from the National Disaster Management Agency (Badan Nasional Penanggulangan Bencana, BNPB), a total of 7,318 disasters were recorded during the 2023–2024 period, resulting in 737 fatalities. Indonesia is categorized as a disaster-prone region, facing risks from natural, non-natural, and social disasters. This vulnerability is influenced by various factors, including geographical, demographic, sociological, and historical conditions. The occurrence of disasters in Indonesia highlights the urgency of addressing natural disasters with serious and comprehensive measures.³

Gorontalo is a province consisting of five regencies and one city, with topography dominated by hills and mountains of varying elevations. Between 2020 and 2022, a total of 83 disasters were recorded in the Gorontalo region, including earthquakes and floods. According to data collected from DIBI (Data Informasi Bencana Indonesia), BNPB (Badan Nasional Penanggulangan Bencana), and BPBD (Badan Penanggulangan Bencana Daerah), Gorontalo Province has experienced 169 disasters over the past decade. These figures indicate that the frequency of natural disasters is relatively high on global, national, and local scales.⁴

To reduce risks, prepare for disaster emergency responses, and facilitate recovery from disaster impacts, disaster management efforts involving various stakeholders are essential. Schools play a crucial role in disaster management, not only as educational institutions but also as centers for information dissemination, evacuation, and psychosocial support. Schools can provide disaster risk education, conduct evacuation drills, and offer physical and psychological support. Additionally, schools serve as community evacuation centers, acting as a frontline in safeguarding the safety and well-being of residents during disasters.⁵

Knowledge of evacuation procedures, safe routes, and emergency actions must be supported by a positive attitude to encourage active community participation in evacuation efforts. This is highly important as it can be utilized as a disaster-related skill in the event of a disaster. If not properly understood, it may have adverse effect on both individual and the

surrounding environment. Therefore, this study focuses on understanding the knowledge of school members regarding independent disaster evacuation.⁶ The study aims to evaluate the level of knowledge among school members about independent evacuation and contribute to the development of more effective educational programs to enhance community preparedness for natural disasters.

Methods

This study employed a quantitative approach using descriptive quantitative methods. The research had been conducted at SMP (Junior High School) 1 Botupingge. It was started in August 2024 and was completed in november 2024. The sample size was determined based on the sampling formula by Gay & Airasian (2009), selecting 20% of the total population.⁷ The sampling technique used in this study is accidental sampling, resulting in a final sample size of 63 participants, which was obtained by taking 20% of the total population of 313 people, comprising school members who were willing to serve as research respondents. Prior to the data collection, respondents were required to sign the informed consent form after receiving a detailed explanation.

The assessment of knowledge regarding independent evacuation of disaster victims included several components: the definition of disaster evacuation, levels of disaster evacuation, general mechanisms for aiding and evacuating disaster victims, targets and objectives of disaster evacuation, and techniques for independent evacuation of disaster victims. The variable used in this study was the knowledge of school members about independent evacuation of disaster victims, categorized into three levels: good, sufficient, and insufficient. The criteria for assessment are as follows: good (final score 76–100), sufficient (56–75), and insufficient (<55). Research data were collected directly through primary data obtained from respondents. Data processing and analysis were conducted using the Statistical Package for Social Sciences (SPSS) software and analyzed with univariate analysis techniques.

The instrument used in this study was a questionnaire that has undergone validity and reliability testing using SPSS software. The questionnaire on knowledge of independent evacuation of disaster victims was distributed to respondents in printed form and utilized the Guttman scale, consisting of 24 yes-no questions. The questionnaire comprises 24 items, including 12 positive (+) and 12 negative (-) questions. The scoring for positive questions is "Correct = 1" and "Incorrect = 0."

Result

Table 1 shows that, out of a total of 63 respondents, the majority were female, with 44 respondents (69.8%), and 19 were male (30.2%). Among the male group, the frequency distribution of knowledge levels shows that most felt under the "good" category, with 9 respondents, followed by the "sufficient" category with 8 respondents, and "insufficient" with 2 respondents. Meanwhile, among the female group, the highest frequency of knowledge levels was in the "good" category, with 26 respondents, followed by "sufficient" with 18 respondents, and no respondents in the "insufficient" category.

Table 1. Respondent characteristics based on gender, age and profession

Characteristics Respondent	Frequency	Percentage (%)
Gender		
Male	19	30.2
Female	44	69.8
Age		
12 – 16	40	63.5
24 – 34	10	15.9
35 – 44	7	11.1
45 – 54	6	9.5
Profession		
Student	40	63.5
Teacher	17	27
Administrative staff	6	9.5

Regarding age characteristics, the age distribution of respondents at SMP 1 Botupingge was dominated by the 14-year-old group (34.9%). Based on the respondents' knowledge levels according to age, the majority of respondents aged 14 years (35%) had a "sufficient" level of knowledge, with 14 respondents, followed by "good" knowledge at 8 respondents. The 13-year-old group ranks second (19%), with the majority had a "good" knowledge level, represented by 9 respondents.

Regarding the characteristics based on respondents' professions at the school, the frequency distribution of respondents at SMP 1 Botupingge shows that the majority of respondents were students, with 40 respondents (63.5%), followed by teachers with 17 respondents (27%), and administrative staff with 6 respondents (9.5%). Based on knowledge levels for each group, the majority of student respondents showed an equal distribution in the "good" and "sufficient" categories, with 19 respondents (47.5%) in each category. Among teacher respondents, the dominant knowledge level was "good," with 14 respondents

(82.4%). Meanwhile, among administrative staff respondents, the most frequent knowledge level was "sufficient," with 4 respondents (6.3%).

Table 2 presents the frequency distribution of knowledge levels categorized as "good," "sufficient," and "insufficient." The majority of respondents felt under the "good" category, with 35 respondents (55.6%), followed by the "sufficient" category with 26 respondents (41.3%), and the "insufficient" category with the fewest respondents, totaling 2 (3.1%).

Table 2. Frequency distribution of respondents' knowledge level

Knowledge Category	Frequency	Percentage (%)
Good	35	55.6
Sufficient	26	41.3
Insufficient	2	3.1

The distribution of knowledge for each respondent type shows the knowledge results for each group (Table 3). At the "good" knowledge level, a total of 35 respondents (55.6%) were recorded, consisting of 19 students (30.2%), 14 teachers (22.2%), and 2 administrative staff members (3.2%).

Table 3. Frequency distribution of knowledge for each type of respondent

Respondent	Knowledge Level						Total	
	Insufficient		Sufficient		Good		n	%
	n	%	n	%	n	%		
Student	2	3.2	19	30.2	19	30.2	40	63.5
Teacher	0	0.0	3	4.8	14	22.2	17	27
Administrative staff	0	0.0	4	6.3	2	3.2	6	9.5
Total	2	3.2	26	41.3	35	55.6	63	100.0

Discussion

The analysis results indicate a significant difference in disaster preparedness knowledge levels based on gender. Among the 63 respondents, females were more dominant in the "good" knowledge category (26 respondents) compared to males (9 respondents). In contrast, the "insufficient" knowledge category was dominated by males (2 respondents), while no females were found in this category. These findings are consistent with the study by Aprilia (2023), which revealed that females tend to have better preparedness compared to males, with a higher proportion of female respondents (64%) compared to males (36%).⁸

The high proportion of females in the "good" knowledge category can be linked to

factors such as emotionality, social roles, and access to information. Previous studies have indicated that females tend to be more sensitive to risks and proactive in preventive measures, although high emotional responses may hinder rational decision-making.^{9,10} In contrast, males tend to rely more on logic but exhibit lower awareness of risks. Additionally, the division of social roles also influences preparedness levels. Males are more likely to have access to technical training and formal information, while females are more actively involved in household-level mitigation, such as preparing emergency supplies.¹¹

The difference in access to information also plays a crucial role. Males are generally exposed to formal information through their work or training, while females often obtain information through informal channels, such as community networks.¹⁰ Community-based communication strategies are considered important for enhancing inclusive access to information and ensuring equitable preparedness across genders.¹² Therefore, females are more responsive to disaster threats because they are more proactive in seeking information and preparing preventive measures.

The age distribution of respondents is dominated by the 12–15-year-old group, which corresponds to a cognitive development stage where logical and abstract thinking abilities begin to develop, yet still require guidance in decision-making.¹³ In contrast, the adult age group (33 years and older) has fewer respondents, with a relatively even distribution of "good" knowledge across each age group.

These results indicate the need for a focus on enhancing knowledge within the adolescent age group to optimize their cognitive development potential. Education for the 12–15-year-old group should be prioritized, as they dominate the respondent pool but still require knowledge enhancement to reach the "good" category.¹⁴ Meanwhile, the adult age group requires a different approach, such as more practical information that is relevant to their daily experiences. Although the number of adult respondents is smaller, they have the potential to exert a significant influence on knowledge-based actions. Therefore, the implementation of age-based educational strategies is crucial to ensure that the content delivered aligns with the cognitive development stages and specific needs of each age group. This can enhance the overall effectiveness of education programs and disaster preparedness.

Based on the data analysis of the 24 questions regarding knowledge of independent evacuation of disaster victims, the knowledge levels of school members were categorized into three groups. Respondents with "good" knowledge totaled 35 (55.6%), "sufficient" knowledge was 26 (41.3%), and "insufficient" knowledge was 2 (3.1%). The majority of respondents in the "good" knowledge category were teachers (14 respondents or 70%),

followed by students (19 respondents or 47.5%), and administrative staff (2 respondents or 33.3%). These findings support the results of Ana and Dewi (2024), who reported that 66.0% of students had good knowledge regarding independent evacuation.¹⁵

From a tectonic perspective, Bone Bolango is a region prone to earthquake and tsunami disasters.¹⁶ Several factors influence knowledge levels, including education and experience. Pariati and Jumriani (2021) explain that the higher an individual's level of education, the broader their knowledge base. This is reflected in the higher percentage of "good" knowledge among teachers compared to students and administrative staff, given that teachers typically have higher education levels.¹⁷ Additionally, experience is also a significant factor, where individuals with greater disaster-related experience tend to have better knowledge.

Another factor influencing the analysis results is the implementation of disaster simulation programs and training in schools. Rahman (2024) found a significant increase in awareness and preparedness after training, from 68.5% to 92%. Regular simulations involving all school members, such as those conducted at SDN 1 Soropia, can enhance preparedness, with 91.9% of respondents acknowledging the effectiveness of the simulations. The ease of access to formal training is also a determining factor. Teachers or staff who have participated in disaster-related training from organizations such as BPBD have a better understanding, which can be transferred to students. The findings of this study are consistent with Rahman (2024), where understanding of evacuation procedures increased from 75.6% to 94.2% after training. Therefore, improving access to training and direct involvement from disaster management institutions is crucial to enhancing the capacity of all school members to face emergency situations.¹⁸

At SMP Negeri 1 Botupingge, several socialization sessions have been conducted, including the provision of materials on disaster management, including proper evacuation procedures. However, not all school members attended these sessions. This may influence the responses provided by the respondents in this study. Some students who attended the sessions generally exhibited better knowledge compared to other school members who did not participate. A study by Yusuf (2024) found that disaster training through material provision successfully improved students' knowledge to the "good" category. These results indicate that disaster programs at schools, such as disaster simulations and evacuation training, significantly contribute to improving knowledge and preparedness among school members. Additionally, integrating disaster-related material into extracurricular activities, such as group discussions and hands-on practice, reinforces students' understanding, making them more prepared to apply the knowledge when needed.¹⁹ A study by Gani (2024) showed that

disaster knowledge levels among medical students at the Faculty of Medicine, Gorontalo State University, were categorized as good, but no significant relationship was found between knowledge levels and disaster preparedness attitudes.²⁰ The researcher assumes that the insignificant results may be due to several factors, one of which is how individuals interpret a situation based on the challenges they face. The novelty of this study lies in its focus on self-evacuation, specifically exploring how individuals can use their own evacuation skills to assist in evacuating others during a disaster. This approach provides a unique perspective on disaster preparedness, emphasizing personal responsibility in ensuring the safety of both oneself and others in crisis situations. This can also be further enhanced by implementing disaster training or simulations, ensuring that the theory learned can be directly applied when a disaster occurs. Such practices would not only reinforce individual preparedness but also promote a more effective collective response during actual disaster situations.

The limitations of this study include the relatively small sample size. Additionally, during the data collection process, some respondents were not directly supervised by the researcher while completing the questionnaire, which may have led to potential biases in the research results.

Conclusion

The majority of school members at SMP Negeri 1 Botupingge have a "good" level of knowledge. This indicates a relatively high level of awareness regarding the procedures for independent evacuation among most school members. To further enhance this understanding, it is recommended that the government strengthen disaster preparedness programs by providing regular simulations and training at SMP Negeri 1 Botupingge. Additionally, future research is encouraged to examine the impact of evacuation education on the knowledge of school members.

Conflict of Interest

Nothing to declare

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