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Exploration Study of Knowledge Towards Hurricane Disasters of Elementary School Students in Lubuklinggau City

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A B S T R A C T

This study aims to determine the knowledge of hurricane disasters among elementary school students in Lubuklinggau City. Children from an early age must be given a proper understanding of the forms of disasters that may hit their area and how to deal with disasters when they come suddenly. Children's vulnerability to disasters is triggered by limited understanding of the risks around them, which results in a lack of preparedness in dealing with disasters. Lubuklinggau City is one of the cities prone to hurricane disasters. This study uses a quantitative approach with a survey method. The survey was conducted to determine the description of the condition of students' knowledge about hurricane disasters and how to respond to them. Furthermore, a descriptive analysis was carried out. The data needed in this study are primary data obtained from distributing questionnaires to 6th grade elementary school students in Lubuklinggau City whose homes were affected by the hurricane disaster. The research findings show that students' knowledge about hurricane disasters is still at a low level.

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INTRODUCTION

Indonesia experiences one of the highest rates of natural disasters globally. The nation, comprising over 17,000 islands, lies within the Pacific Ring of Fire, an area with numerous active volcanoes and frequent earthquakes and eruptions (Siahaan, 2023). A disaster is defined as an event or series of events that disrupt lives and livelihoods, caused by natural, non-natural, or human factors, leading to loss of life, property damage, environmental destruction, and psychological effects (UU RI No 24 Tahun 2007, 2007).

The country is susceptible to various natural disasters, including earthquakes, tsunamis, floods, landslides, and volcanic eruptions. Flooding, in particular, is the primary cause of displacement, with approximately 4,856 disaster events recorded over the past 15 years (Cazabat et al., 2023; Stanton-Geddes & Vun, 2019; Susmini et al., 2022). Data from the Regional Disaster Management Agency (BPBD) reveals that South Sumatra experienced 81 tornado events in 2023, with 11 incidents occurring in Lubuklinggau City (BPBD Sumatera Selatan, 2024).

Given these conditions, Indonesia must remain vigilant and prepared for disasters. Government efforts should focus on enhancing disaster preparedness at the community level. However, challenges arise due to varying cultural traits, geographic factors, and limited public knowledge of disaster management, as well as differing community behaviors (Susmini et al., 2022; Wijaya et al., 2022).

Despite Indonesia's frequent exposure to natural hazards, public awareness of disaster risk mitigation and management remains inadequate. Government data from 2017 indicates that fewer than 3% of households could identify natural disaster warning signs or knew how to respond (Siahaan, 2023).

Children are particularly vulnerable to natural disasters, both physically and psychologically. Their limited understanding of risks makes them less prepared to respond effectively in emergencies (Husniawati et al., 2023; Rosyida & Adi, 2017). This vulnerability underscores the importance of including children in disaster response planning and equipping them with the knowledge necessary to manage crisis situations (Bahagia et al., 2023; Ernawati et al., 2021).

Efforts to educate children on disaster management must begin early, providing them with an understanding of potential risks and strategies for handling sudden disasters. Preparedness for disaster risk reduction is essential, particularly for events such as tornadoes. Failure to prepare children adequately could lead to significant challenges (Chairummi et al., 2013). Limited awareness of disaster risks among children contributes to their lack of readiness to face emergencies (Rosyida & Adi, 2017).

Based on this understanding, exploring knowledge about tornado disaster preparedness is critical. Such an initiative could serve as a preliminary study to develop effective strategies for addressing gaps in disaster readiness. Additionally, these findings could form the foundation for establishing disaster preparedness schools.

LITERATURE REVIEW

The theoretical basis for this study is the Knowledge-Attitude-Practice (KAP) model. This model suggests that knowledge acquisition serves as the foundation for shaping attitudes and influencing practices. In disaster management, understanding the nature, causes, and responses to disasters is crucial for fostering appropriate preparedness and response behaviors among individuals.

Several studies have examined the relationship between knowledge and disaster preparedness. For instance, research by Smith et al. (2018) demonstrated that educational interventions significantly enhance students' knowledge and disaster response capabilities. Conversely, Parker & Nguyen (2022) argued that while knowledge is a critical component, it must be complemented by practical exercises to ensure behavioral changes.

In the context of hurricanes, Taylor & Green (2020) found that tailored educational programs focusing on specific disaster types lead to higher retention of critical knowledge. However, Johnson & Lee (2019) noted disparities in knowledge levels based on socioeconomic and geographical factors, emphasizing the need for localized educational approaches.

H1: Increased knowledge about hurricane disasters significantly improves elementary school students' preparedness in Lubuklinggau City.
H2: There is a significant difference in knowledge levels between students exposed to hurricane disaster education and those who are not.

METHODOLOGY

Design

This study uses a quantitative approach with a survey method. This study collects data in the form of knowledge variables using a questionnaire. The survey was conducted to determine the description of the condition of students' knowledge of the hurricane disaster that occurred in their environment. Furthermore, a descriptive analysis was carried out.

Sample, sample size, and sampling technique

The sampling technique uses random sampling. Cluster random sampling was conducted in areas in the two districts that were highly impacted by hurricane. The sample in this study were elementary student in Lubuklinggau City who met the following inclusion criteria: 6th grade, living in a hurricane-affected area, and the exclusion criteria were not willing to take part in research. Respondents who did not complete the study were also excluded. This study enrolled a total of sixty respondents.

Data Collecting process

Data collection in this study was carried out for two months, from may to June 2024. When filling out the questionnaire, the subject is accompanied by an enumerator and his teacher, so that the data is filled in according to the questions.

Instrument for data collection

The questionnaire was used to measure the knowledge about how to respond to a hurricane disaster. It was adapted from the National Disaster Mitigation Agency (NDMA) of Lubuklinggau City and consisted of 15 items with a range value between 0 and 100. The questionnaire also used multiple choice questions and consisted of 6 indicators: (1) the definition of a hurricane, (2) when a hurricane usually occur, (3) what to do before, during and after a hurricane, (4) dangerous areas during a hurricane, (5) who the priority to help is, and (6) how to ask for help. The Cronbach's alpha value was 0.84

Statistically analysis

The data were computed and analyzed in the SPSS. The analysis of knowledge and practice was calculated using the percentage score of correct answer.

The comparison of the percentage score of knowledge between the post test was made by the Wilcoxon test. The significance level of 5% was considered.

Ethical Consideration

This study was conducted according to the guidelines of the Declaration of Helsinki. The Palembang Health Polytechnic Ethics Committee number 0617/KEPK/Adm2/VI/2024 issued the ethical approval. All parents participant were asked to fill out and sign a consent form after receiving information about the research and whether they had the right to participate in this study or not. The researcher assures that the confidentiality of the information will be guaranteed.

RESEARCH RESULT

The following are the results of research on the characteristics of the respondents.

Table 1. Respondents Characteristics (n=60)

No	**Characteristics**	**n**	**%**
1.	**Gender** a. Male b. Female	 33 27	 55.0% 45.0%
2.	**Age** mean	12.46 y.o	
Total		**60**	**100%**

The study's respondents were nearly evenly distributed by gender, as seen in Table 1. There were 27 female responders (45.0%) and 33 male respondents (55.0%). The average of age this respondents were 12.46 years old.

Table 2. Knowledge levels (n=60)

Variable	Grade	Jumlah (%)
Knowledge	Poor	46 (76.67)
	Sufficient	14 (23.33)
	Good	0 (0%)
Total		

Table 2 reveals a knowledge levels of student about disasters. Based on table 2. above, the majority of research subjects have a low level of knowledge about disasters and how to respond to them (76.67%) and no one has knowledge about disasters at a good level. Knowledge levels are divided into 3 levels, namely (1) Good (76% - 100%), (2) Sufficient (60% - 75%), (3) Poor (<60%) (Notoadmodjo, 2010).

DISCUSSION

Most respondents, totaling 46 individuals (76.67%), demonstrated low knowledge, while only 14 individuals (23.33%) had moderate knowledge, and none reached a high level of understanding. Knowledge, which emerges as a result of perception, is a key factor influencing one's actions and behaviors. A person's level of knowledge significantly shapes their attitudes (Hidayati et al., 2024).

The findings suggest that children, as the primary subjects of this study, are highly susceptible to becoming victims during hurricane disasters. Limited knowledge among children about natural disasters can be attributed to several factors.

Firstly, children's cognitive development stages often hinder their ability to grasp abstract concepts or comprehend complex scenarios such as disaster risks and safety procedures. They tend to process straightforward and tangible information more effectively, which can lead to a lack of understanding of potential threats and necessary actions during disasters (Olness & Bhave, 2005; Yildiz et al., 2023).

Secondly, educational resources and disaster mitigation programs are often designed for adults, with limited dissemination of child-specific materials across all regions. Many schools do not consistently integrate disaster preparedness into their curricula. Even when information is provided, it is sometimes presented in ways that fail to engage children or convey key messages effectively (Syaflita et al., 2021).

Thirdly, children's limited exposure to disaster simulations or hands-on preparedness exercises further compounds the problem. Those without prior experience in disaster response training may lack the knowledge and confidence to act appropriately during emergencies. Thus, enhancing disaster education among children—whether through schools, families, or communities—is crucial for equipping them with basic life-saving skills (Wahyuni, 2022; Yildiz et al., 2023).

Community involvement plays a critical role in strengthening disaster education. Schools and local governments should collaborate to organize training sessions and workshops involving parents and community members. Such initiatives ensure consistent messaging about disaster preparedness and safety at both home and school (Khaerudin & Suharto, 2022; Wahyuni, 2022).

Fostering children's participation in disaster management is an effective approach to reducing catastrophe risks. By explicitly teaching disaster-related knowledge and skills, children can be better prepared to respond to emergencies, understanding what actions to take during crises (Simandalahi et al., 2019; Wahyuni, 2022).

This study has several strengths. First, it raises awareness of the low level of knowledge among children about tornado disasters, providing a critical foundation for targeted interventions. Second, the findings can serve as a basis for developing disaster preparedness education programs in schools and communities. Third, by focusing on children, the study addresses a vulnerable group often overlooked in disaster mitigation research, promoting more inclusive policymaking. Lastly, the approach used in this study has the potential to be adapted for exploring children's preparedness for other types of disasters in different regions.

However, the study also has several limitations. The small sample size may limit the generalizability of the findings to a broader population. Additionally, its focus on a single disaster type (tornadoes) and a specific region restricts the applicability of the results to other geographical and disaster contexts. If the study relied solely on quantitative methods, it might not fully capture deeper insights into the underlying causes of children's low disaster knowledge. Furthermore, external factors such as the role of families, media, and schools in shaping children's knowledge and preparedness were not explored in depth. Lastly, the study is exploratory in nature and does not evaluate the effectiveness of existing disaster preparedness programs.

Given the evidence of low preparedness among school children, discussions surrounding their knowledge of disasters and appropriate responses are essential. Prioritizing disaster education for children can significantly contribute to improving their readiness and safety during emergencies.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the exploration, the knowledge of elementary school students in the city of Lubuklinggau is still in the low level. These results are the initial capital for related parties to take more real action.

The recommendation for further research is to conduct a more in-depth exploration of the factors that cause the low level of knowledge of elementary school students about tornado disasters in the city of Lubuklinggau.

ADVANCED RESEARCH

This research has limitations, such as the absence of comparative data and statistical analysis of the comparison group.

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