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Preparedness of Lab School Middle School Students Towards Earthquakes for Disaster Risk Reduction

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ABSTRACT

The primary objective of this research is to observe and analyze the preparedness of Labschool Middle School students in Palu City for Disaster Risk Reduction. The population in this study consisted of all students at Palu City Labschool Middle School, using a total sampling technique, resulting in a sample size of 100 students. Data was collected using structured questionnaires that were directly filled out by the students. The questionnaires were designed to cover all aspects of the research variables and provide a comprehensive assessment of the student's preparedness. Data processing in this study utilized a computerized system via MS Excel. Knowledge: 95% of respondents rated their knowledge on the subject as not good. This indicates that the majority of respondents have a poor understanding of the topic. Early Warning System: 57% of respondents rated the early warning system as not good. Resource Mobilization: 73% of respondents rated resource mobilization as not good. This indicates significant issues in resource mobilization, with the majority of respondents feeling that improvements are needed in this area. The findings indicate a significant gap in disaster preparedness among Labschool Middle School students. The majority lack basic knowledge about natural disasters and have minimal exposure to disaster-related training or education. Despite the availability of disaster warning tools in schools, awareness and understanding of their use remain limited. An effective early warning system is crucial for community safety, yet many students exhibit low awareness and preparedness levels.

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Key Messages:

- This highlights the critical need for comprehensive disaster education programs in schools, which should include regular drills, practical training in emergency response, and collaborations with local disaster management agencies. By improving disaster knowledge and readiness, students can be better equipped to respond effectively to future disasters, thereby reducing potential risks and losses.
- Effective early warning systems are essential for community safety, enabling quick and appropriate responses to potential dangers. Enhancing awareness and understanding of these systems among students is crucial, as it can lead to more effective mobilization of resources and better preparedness in the face of natural disasters
- Schools should focus on integrating early warning system education into their curriculum to foster a culture of preparedness and resilience.

Introduction

Central Sulawesi is one of the earthquake-prone areas in Indonesia due to its proximity to earthquake epicenters both on land and at sea. These epicenters are the result of tectonic processes. The sea-based epicenters stem from the subduction of North Sulawesi, located to the north of Sulawesi Island, while the land-based epicenters originate from several active faults on the mainland of Central Sulawesi, notably the Palu-Koro Fault (1). The earthquake that struck in September 2018, with a magnitude of 7.4 at 17:02:45 WITA, was followed by a tsunami, with the highest recorded wave reaching 11.3 meters in Tondo Village, East Palu, and the lowest at 2.2 meters in Mapaga Village, Donggala Regency. This earthquake also caused liquefaction in several areas, notably Balaroa and Petobo in Palu City, and Jono Oge in Sigi Regency, where the ground surface experienced dramatic shifts.

Preparedness is a series of activities carried out to anticipate disasters through organized and effective measures. Disaster preparedness is influenced by several factors including knowledge, attitudes, disaster emergency response plans, disaster warning systems, and resource mobilization (2). The knowledge possessed by individuals or communities is a crucial element of preparedness. This knowledge influences attitudes and behaviors, especially in anticipating disasters. Preparedness is essential as it is a key determinant of disaster risk reduction that can be implemented and pursued early (3).

Experience shows that a lack of knowledge correlates with inadequate attitudes and behaviors towards disaster risk anticipation, leading to a lack of preparedness and increased risk during disasters (4). Disaster preparedness can be grouped into four main parameters: knowledge and attitudes, emergency planning, early warning systems, and resource mobilization (5). These parameters are vital for risk reduction in disaster-prone areas. Disasters have far-reaching impacts, causing distress and necessitating community preparedness, both psychologically and in daily activities (6). This is critical for both adults and students, who must be prepared to face disasters in their environments.

To ensure earthquake disaster preparedness in schools, the school must prepare sufficient human, facilities, infrastructure, and financial resources for its management. Mobilization of student resources in the context of 5 disaster preparedness is based on the school's capabilities, where this mobilization also opens up opportunities for participation for stakeholders (7). In anticipating earthquake disaster preparedness, an early warning system also needs to be developed in schools. This is to empower students to act appropriately in avoiding the possibility of accidents or death due to disasters. The primary objective of this research is to observe and analyze the preparedness of Labschool Middle School students in Palu City for Disaster Risk Reduction.

Methods

The research conducted was descriptive quantitative research aimed at observing and analyzing the preparedness of Labschool Middle School students in Palu City for Disaster Risk Reduction. The population in this study consisted of all students at Palu City Labschool Middle School, using a total sampling technique, resulting in a sample size of 100 students.

The research variables included: 1) Knowledge: This variable assessed the students' understanding of natural disasters, including definitions, causes, and characteristics of earthquakes, as well as awareness of earthquake-resistant building structures. The aim was to evaluate the depth of their knowledge regarding disaster-related concepts; 2) Early Warning System: This variable focused on the student's awareness and understanding of the early warning systems in place. It included their knowledge about the components of an early warning system, such as hazard identification, risk assessment, and the dissemination of warnings. The goal was to determine how well students could respond to warnings and the effectiveness of these systems in the school environment; 3) Resource Mobilization: This variable examined the students' preparedness in terms of resource mobilization during a disaster. It included their ability to utilize available resources, knowledge of emergency response tools and procedures, and their participation in disaster preparedness training or seminars. The aim was to assess the readiness of students to effectively mobilize resources during an emergency.

Data was collected using structured questionnaires that were directly filled out by the students. The questionnaires were designed to cover all aspects of the research variables and provide a comprehensive assessment of the student's preparedness. Data processing in this study utilized a computerized system via MS Excel.

Results

Figure 1 shows the distribution of responses based on three categories: Knowledge, Early Warning System, and Resource Mobilization. Each category is divided into two quality responses: Not Good and Good, represented by red and green colors, respectively. Knowledge: 95% of respondents rated their knowledge on the subject as not good. Only 5% of respondents felt their knowledge was adequate. This indicates that the majority of respondents have a poor understanding of the topic. Early Warning System: 57% of respondents rated the early warning system as not good. 43% of respondents rated the early warning system as good. This distribution shows that while most feel the system needs improvement, a significant number believe the system is functioning well. Resource Mobilization: 73% of respondents rated resource mobilization as not good. 27% of respondents felt that resource mobilization was good. This indicates significant issues in resource mobilization, with the majority of respondents feeling that improvements are needed in this area.

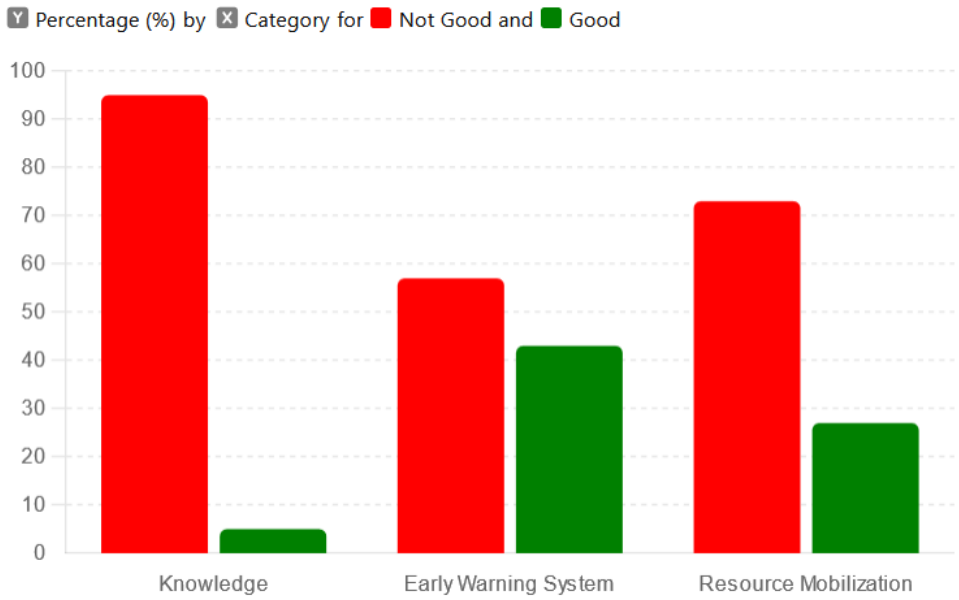

Figure 1. Distribution of responses based on three categories: Knowledge, Early Warning System, and Resource Mobilization.

Discussion

Based on the results of observations and interviews, it was found that most respondents from Labschool Middle School are still unable to correctly define a natural disaster, leading to inaccurate answers to other related questions. Respondents were also unable to correctly explain the causes of earthquakes and mistakenly believed that earthquakes could be predicted. However, some respondents correctly identified the characteristics of strong earthquakes, likely due to their ability to directly observe or feel them. When it comes to earthquake-resistant buildings, respondents were generally confused, resulting in mostly incorrect answers. Information related to natural disasters, particularly earthquakes and tsunamis, has not been widely disseminated in school or daily activities. Many respondents' knowledge comes from their direct experience with the 2018 earthquake. This is consistent with the questionnaire results filled out by the respondents. Health education and promotion can be integrated into curriculum-based or training-based disaster risk reduction (DRR) programs as modules, short courses, drills, and printed and visual media (8).

Disaster mitigation, an essential early warning system, comprises four components: knowledge (covering hazards and risks, forecasting, warning, and reaction), observation (earthquake and sea level monitoring), integration and dissemination of information, and preparedness. Effective disaster warning systems play a crucial role in community preparedness, helping to avoid potential dangers by enabling quick and appropriate responses to warnings (9). Despite this, the univariate analysis revealed that 57 respondents had a poor early warning system, while 43 respondents had a good early warning system. This indicates that Labschool Middle School students still have a low level of early warning system awareness regarding disaster preparedness.

Observations and interviews through questionnaires revealed that disaster warning information in the respondents' area was obtained traditionally from local community leaders. Although schools have disaster warning tools, a small number of respondents were unaware of these tools or their functions. However, most respondents were knowledgeable about the tools and how they provide warnings about different natural disasters. If a warning sign indicates the need for self-rescue, most respondents answered 'YES' to calming themselves and avoiding panic, followed by listening to directions from authorized agencies regarding potential aftershocks. The questionnaire analysis showed that few respondents had attended training or seminars related to disasters, including knowledge about disasters, emergency response planning, and early warning systems. This lack of training contributes to their minimal knowledge in these areas. Furthermore, there is a lack of practice in disaster warnings, first aid, and rescue and evacuation. These findings demonstrate that the resource mobilization parameters of Labschool Middle School students are not yet ready, as reflected in the low percentage scores on several question items.

The importance of effective early warning systems and public education in reducing disaster risk (10). Community-based approaches to disaster risk reduction, which involve local leaders and traditional knowledge, significantly enhance preparedness and response efforts (11). Similarly, the

research by Paton and Johnston (2001) emphasizes the role of education and community engagement in improving disaster resilience (12). Their findings suggest that schools play a critical role in disseminating disaster knowledge and fostering a culture of preparedness. Schools and teachers play a pivotal role in fostering this resilience, not just among students but the broader community (13). Disaster education programs have the potential to enhance local knowledge, attitudes, and skills, leading to improved disaster preparedness and response (14).

Conclusion

The findings indicate a significant gap in disaster preparedness among Labschool Middle School students. The majority lack basic knowledge about natural disasters and have minimal exposure to disaster-related training or education. Despite the availability of disaster warning tools in schools, awareness and understanding of their use remain limited. An effective early warning system is crucial for community safety, yet many students exhibit low awareness and preparedness levels. To enhance disaster readiness, it is essential to implement comprehensive educational programs focusing on disaster knowledge, early warning systems, and practical training in first aid, rescue, and evacuation procedures.

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Conflicts of Interest: The authors declare no conflict of interest

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