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EMERGENCY PREPAREDNESS PLANNING AND ITS EFFECT ON LANDSLIDE DISASTER READINESS: A COMMUNITY-BASED STUDY

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ABSTRACT

Introduction: The problem of landslide risk that has a significant impact and the importance of preparedness efforts. The public must understand the emergency plan to overcome the risk of landslides that can threaten safety, so it is necessary to provide an Emergency Planning simulation. This study was intended to explore the effect of emergency preparedness planning on community's ability to prepare for and respond to landslide disasters.

Method: This research with Preexperimental design involved 84 respondents as the sample size through purposive sampling technique with inclusion criteria of youth groups aged 17-35 years. In this study, Emergency Planning simulation intervention was given twice with a duration of 50-120 minutes for each face-to-face meeting.

Results: The results showed an increase in community preparedness in the good category, which initially increased from 33.3% to 53.5% and a decrease in the less prepared category from 14.3% to 3.6%. The results of the Wilcoxon test data analysis obtained P value: 0.001 (<α: 0.05) indicating an influence of emergency preparedness planning on community's ability to prepare for and respond to landslide disasters.

Conclusion: Emergency planning simulation can increase public knowledge and awareness of the importance of preparedness in facing landslides, so as to minimize the number of victims and losses that will be experienced. It is recommended that the application of Emergency planning can be expanded to the entire community so as to increase joint preparedness.

Keywords: youth groups; simulation; emergency planning; readiness.

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INTRODUCTION

Landslides are a common natural disaster in Indonesia, particularly in hilly, mountainous, or steeply sloped areas. According to data from the National Disaster Management Agency (BNPB), landslides are among the third most frequent disasters in Indonesia, particularly during the rainy season. However, despite their high frequency, public awareness and preparedness for these disasters remain relatively low (Ariyani & Endiyono, 2020).

Many landslide-prone villages, such as those found in Kepung, Mojo, Semen, and Grogol districts in Kediri, are prone to landslides due to their hillside locations and roadside slopes that are prone to landslides during heavy rain. Most residents lack basic mitigation measures, such as recognizing early signs of landslides, creating a family evacuation plan, or the importance of vegetation and proper drainage on sloping land. In fact, research by Ariyani & Endiyono (2020) found that many residents were unaware of how to deal with landslides before

receiving health education on landslide mitigation (Ariyani & Endiyono, 2020). This illustrates the need for health education to improve community preparedness on how to deal with landslides. This situation is exacerbated by the lack of formal education or training related to natural disasters. Limited access to information and the weak role of village governments in disaster education further increase the risk of loss of life and material losses when a disaster occurs. This phenomenon demonstrates a significant gap between the potential danger of landslides and the level of community preparedness. Without immediate intervention through disaster education, simulation training, and strengthening local capacity, communities will remain in a cycle of high vulnerability to landslides.

Indonesia' geographical location is flanked by the continents of the Asian and Australian, between the Pacific and Indian Oceans, and is a meeting point between the three main plates in the world, namely the Eurasian, Pacific, and Australian plates which cause collisions (Haribulan et al., 2019). This collision causes the formation of a volcanic path consisting of a row of mountains and hills with gentle to steep slopes which cause potential landslides (Sunimbar & Angin, 2021). Data from the National Disaster Management Agency (BNPB) shows that landslides are one of the most frequent disasters every year and have a wide impact on social, economic, and environmental aspects (Badan Nasional Penanggulangan Bencana, 2016).

Although landslides have become a recurring threat, the level of community's ability to prepare for and respond to landslide disasters is still relatively low (Mustika, 2024). This can be seen from the lack of community knowledge about the early signs of landslides, the lack of evacuation plans, and the limited facilities and infrastructure to support disaster mitigation in their residential areas (Rohimah et al., 2021). Community preparedness as an important part of the disaster risk reduction system is still often overlooked. The low understanding of disaster risks, the lack of emergency response exercises, and the lack of supporting infrastructure indicate that the community does not yet have adequate capacity to deal with potential landslides independently (Ariyani & Endiyono, 2020). Indonesia is the second country in the world with the greatest potential for natural disasters according to data of the United Nations International Strategy for Disaster Risk Reduction (UNISDR) (Monalia & Dewi, 2024). According to the National Disaster Management Agency for the period 2005-2015, more than 78% of natural disasters occurred, up to 11,648 were hydrometeorological disasters (landslides) (Badan Nasional Penanggulangan Bencana, 2016). Indonesia also has 918 landslide-prone locations spread across various regions (Tuejeh et al., 2023). According to the BNPB Matrix data (2016), East Java Province is one of 12 disaster-prone areas dominated by hydrometeorological disasters, one of which is landslides. East Java Province has 38 districts or 9 cities, of which are disaster-prone areas, including the city of Kediri. Kediri is ranked 65th out of 497 districts/cities in Indonesia (Badan Nasional Penanggulangan Bencana, 2016). Based on the results of a preliminary study using interview and questionnaire methods on 10 villagers, 6 out of 10 people in Besowo are less prepared to face landslides, so that around 60% of the community's readiness for landslides is still low.

Landslides occur due to controlling factors (geology, slope gradient, lithology, faults and joints in rock composition) and triggers (rainfall, erosion, earthquakes and human activities) (Ma'ruf et al., 2021). Given the potential for disasters and the consequences that arise above, community preparedness for landslides has not been standardized, resulting in many fatalities. The level of landslide disaster preparedness in Indonesia tends to be low due to the lack of public knowledge about landslide disaster planning preparedness that can be provided formally. The second factor, early warnings of various landslide disasters have not been properly socialized to the community. The third factor is the lack of emergency planning for socialization to the community (Widagdo & Khasanah, 2023).The worst impacts of landslides include fatalities, damage to facilities and infrastructure, conflicts, economic problems, and physical-psychological-social-spiritual problems (Badan Nasional Penanggulangan Bencana, 2016).

Preventive/promotive efforts such as mitigation counseling, formal socialization in schools, reforestation, construction of embankments on hillsides, roleplay of landslide disaster management can be done to reduce losses that can be caused by landslides. Another way that can be used to explore community's ability to prepare for and respond to landslide disasters is to determine the readiness index. Extensive research that has been conducted in Indonesia on community preparedness for disasters that examining the analysis of mitigation and preparedness for landslide disasters in Ponorogo Regency with research results, namely almost all respondents have mitigation readiness in the ready category, almost all respondents have emergency response planning in the ready category, most

respondents have structural mitigation in the ready category and almost all respondents have non-structural disaster management in the ready category (Hidayatush Sholikah et al., 2021).

Disaster preparedness is defined as activities and actions taken in advance to ensure an active response and temporary relocation of residents and property from threatened locations (Mustika, 2024). Preparedness is part of disaster management that has important role, which is defined as the readiness of communities at all levels to recognize the threats that surround them and have the mechanisms and resources to deal with disasters (Hidayatush Sholikah et al., 2021). In fact, there are still many different interpretations of the concept of preparedness in the community. Preparedness steps include preparing a disaster management plan, maintaining resources and training personnel (Napirah et al., 2023) Preparedness is carried out in the pre-disaster phase with the aim of building and developing the necessary capabilities to manage all types of emergencies effectively and for the transition from response to sustainable recovery. Disaster preparedness means planning carried out to prevent disasters, reduce the impact of disasters on vulnerable gropus and respond effectively and manage the impact of disasters (Hargono et al., 2023).

Emergency Planning is an action planned to minimize the amount of losses when a disaster occurs. Emergency Planning simulation is needed to train local residents to prepare for emergencies and calculate the time needed to avoid landslide-prone areas. This Emergency Planning system can be applied in an emergency. Disasters that occur can be landslides, earthquakes, floods, bomb threats and even fires that cannot be predicted when the disaster occurs. The types of losses that can occur can be in the form of materials, resources and can stop the production process. Emergency Planning wants to know more about the actions prepared to deal with natural disasters. Emergency plans related to evacuation, rescue and rescue to minimize disaster victims (Badan Nasional Penanggulangan Bencana, 2016). Young adults (17-35 years old) are a key pillar of disaster preparedness because they are strong, quick-thinking, and have broad social influence. Strategically empowering this group can accelerate the development of disaster-resilient communities. Mentoring and engaging millennials through a local values approach and practical training strengthens their awareness, knowledge, and skills in disaster mitigation. (Pradika et al., 2018)

Seeing the problem of landslide risk that has a significant impact and the importance of disaster management efforts, it is very necessary to prepare public awareness to participate in non-physical disaster planning. The community must understand the emergency plan to overcome the risk of landslides that can threaten their safety at any time. The increase in the impact of landslides cannot be separated from the increase in population and community environmental management activities. This study was intended to explore the effect of emergency preparedness planning on community's ability to prepare for and respond to landslide disasters.

METHOD

The study conducted in Besowo Village, Kediri used a pre-experimental design in December 2024 specifically a one-group pre-test and post-test design. The variables studied in this study were Emergency Planning (independent variable) and Community Preparedness in dealing with landslides (dependent variable). A sample size of 84 respondents was obtained from a population of 90 people through Purposive sampling with Inclusion Criteria of youth organizations (Karang Taruna) aged 17-35 years, willing to be respondents and able to read and write. The intervention consisted of leaflets and simulation-based training. Conducted over two face-to-face sessions within one week. Each session lasted between 50 to 120 minutes. While the exact leaflet content isn't explicitly listed in the document, based on the discussion and questionnaire items, the leaflet likely included: definition and causes of landslides, early warning signs (e.g., heavy rain, rumbling sounds), emergency evacuation planning, family emergency contact plan and meeting point, importance of disaster kits (first aid, food, water), roles and responsibilities during a disaster, Information sources and communication strategies. Meeting Activities: Session 1 (Day 1 – 50 to 120 minutes), Educational session using leaflets, Interactive discussion on landslide experiences and awareness, Pre-test questionnaire to assess baseline preparedness, Session 2 (Day 7 – 50 to 120 minutes), Simulation exercise: Creating evacuation maps, Practicing evacuation drills, Identifying emergency contacts and resource management, Post-test to evaluate improvement in disaster preparedness. Respondent preparedness data were measured through a questionnaire. The questionnaire was developed by the researchers based on disaster preparedness components and the reliability test of instrument obtained a Cronbach Alpha value of 0.86, containing 36 statements containing dimensions of knowledge and attitudes, disaster warning systems

and emergency response plans resource mobility. The Emergency Planning intervention for landslide disasters used leaflets and simulations which were given 2 meetings for 1 week with a duration of 50-120 minutes each time. Pre- and post-test data were analyzed by Wilcoxon Test with α = 0.05. This research has been declared ethically feasible with a certificate of ethical feasibility no. 110/EC/LPPM/STIKES/KH/X/2024

RESULTS

Presentation of respondent characteristics data includes: age, gender, education, occupation, information, sources of information.

Table 1. Respondent characteristics

General Data of Respondents	n	Prosentase
Age		
17-25 years	39	46,4%
26-35 years	45	53,6%
Total	84	100%
Gender		
Man	60	71,4%
Woman	24	28,6%
Total	84	100%
Education		
No school	0	0,0%
Elementary school	0	0,0%
Senior High School	60	71,4%
College	24	28,6%
Total	84	100%
Job		
Housewife	18	21,4%
Farmer	27	32,1%
Self-employed	3	3,6%
Private sector worker	27	32,1%
Civil servants	6	7,1%
Teacher	3	3,6%
Total	84	100%
Information		
Ever received	57	67,9%
Never received	27	32,1%
Total	84	100%
Resources		
Not Getting Information	27	32,1%
Electronic media	57	67,9%
Total	84	100%

Based on the characteristics of the respondents, it shows that most respondents (53.6%) are 26-35 years old, most respondents (71.4%) are male, most respondents (71.4%) have a high school education, almost half of the respondents (32.1%) work as farmers and private workers, most respondents (67.9%) have received information about landslides and most respondents (67.9%) get information from electronic media. Table 2. Preparedness in facing landslides before intervention is given.

Table 2 Frequency Distribution of Community Preparedness to Face Landslide Disasters Before Being Given Emergency Planning in Besowo Village, Kediri Regency in 2024 (N=84)

Preparedness	Frequency	Prosentase
Not Enough (0-33%)	12	14,3%
Enough (34-66%)	44	52,4%
Good (67-100%)	28	33,3%
Total	**84**	**100%**

Table 2 shows that the respondent data before being given Emergency Planning treatment shows that the majority of respondents (52.4%), namely 44 respondents, had preparedness with the criteria of being sufficiently prepared..

Tabel 3 Frequency Distribution of Community Preparedness for Landslide Disasters After Being Given Emergency Planning in Besowo Village, Kediri Regency in 2024 (N=84)

Preparedness	Frequency	Prosentase
Not Enough (0-33%)	3	3,6%
Enough (34-66%)	36	42,9%
Good (67-100%)	45	53,5%
Jumlah	**84**	**100%**

Table 3 shows the respondent data after being given Emergency Planning treatment, half of the respondents (53.5%), namely 45 respondents, have the criteria for being ready to face landslide disasters.

Table 4 Frequency Distribution of the Influence of Emergency Planning on Community Preparedness in Facing Landslide Disasters in Besowo Village, Kediri Regency in 2024 (N=84)

Preparedness	Pre - intervention		Post - intervention	
	Frequency	Prosentase	Frequency	Prosentase
Not Enough (0-33%)	12	14,3%	3	3,6%
Enough (34-66%)	44	52,4%	36	42,9%
Good (67-100%)	28	33,3%	45	53,5%
Total	84	100%	28	100%
Wilcoxon test : Pvalue = 0,0001 (α : 0,05)				

From the data in table 4, data analysis was carried out using the Wilcoxon test with the results of the sig value (2-tailed) pvalue: 0.0001 <0.05 so that H1 is accepted, meaning that there is an influence of Emergency Planning on community preparedness to face landslides in Besowo Village, Kediri Regency in 2024.

DISCUSSION

Based on the research results, it is known that before being given Emergency Planning treatment, most respondents (52.4%) namely 44 respondents had preparedness with the criteria of being sufficiently prepared. Disaster management is an effort to increase efforts to overcome various disasters through systematic observation and analysis which includes prevention, mitigation, preparedness, emergency response, and rehabilitation. The implementation of landslide disaster management includes the pre-disaster, emergency response, and post-disaster stages. Before a disaster occurs, there is preparedness and mitigation. When a disaster occurs, there is an emergency response to the disaster. After a disaster, what is done is rehabilitation and reconstruction.

In this study, regarding disaster preparedness, the majority of respondents gave the highest score on the question about the definition of landslide disaster. Based on this, all people already understand the definition of landslide disaster, while the preparedness actions to face landslide disasters are not yet understood by the community. This can be seen from the number of questions on the questionnaire about preparedness which still have low scores. Several factors that can affect a person's preparedness in facing a disaster include: age, gender, education and information.

Based on general data from respondents in this study, it shows that most respondents (53.6%) are 26-35 years old, most respondents (71.4%) are male, most respondents (71.4%) have a high school education and most respondents (67.9%) have received information about landslides. Age is a very important factor to influence disaster preparedness (Sitinjak, 2024). The older a person is, the more experience they have. Age also affects a person's memory. The older they are, the more prepared they are for disasters. Most respondents aged 26-35 years old will play a more active role in society and social life and make more preparations for the success of efforts to adapt to old age.

According to the researchers in this study, women are less prepared than men because of the differences in socially determined roles and responsibilities between them. This could also be due to inequalities between them in terms of decision-making power, participation in emergency preparedness organizations and access to resources. People who have graduated from high school have sufficient preparedness, but the community is still unable to apply preparedness in everyday life because they spend most of their time working (Yuliana et al., 2024).

Based on the results of the study, it shows that after being given Emergency Planning, half of the respondents (53.5%) namely 45 have good preparedness criteria in facing landslide disasters. Based on data taken by researchers through questionnaires with knowledge and attitude parameters, all respondents know that landslides can occur due to rainfall and earthquakes, half of the respondents have the motivation to prepare themselves for landslide disasters, almost all respondents know that the characteristics before a landslide occurs landslides are heard rumbling sounds, all respondents have their respective roles when a disaster occurs, most respondents believe that landslides will not happen because the incident occurred 2 years ago, all respondents get information about landslides from social media, all respondents prepare food supplies that need to be cooked in advance to deal with emergency conditions, and most respondents need to have a supply of bottled drinks.

Knowledge is the main and important factor that is the key to preparedness. Knowledge possessed by individuals or communities can usually influence community attitudes and community concerns to have a ready and alert nature in anticipating disasters, especially for those who live in disaster-prone areas such as coastal areas (Arinata et al., 2023)

Based on data collected by researchers through a questionnaire with parameters for a disaster emergency plan, it was stated that most respondents had addresses of important facilities such as hospitals, fire departments, police, PAM, PLN or Telkom, respondents felt the need to know the guidelines regarding emergency response because there were already officers who had studied it, most respondents understood that shortly before the landslide there was heavy rain. All respondents evacuated during a disaster, almost all respondents had maps, family evacuation routes and family gathering places in the event of a tsunami, all respondents had one family member who understood skills related to disaster preparedness, most respondents had a first aid kit that was easy to carry, most respondents knew that communication tools were needed in an emergency, almost all respondents needed to attend seminars/training on disaster preparedness, almost all respondents lived in houses that were as is without complying with building standards for disaster-prone areas, half of respondents provided bags and disaster preparedness equipment that were easy to carry at all times, all respondents had communication tools that could be used to contact during a disaster, all respondents were motivated to attend landslide preparedness training, and almost half of respondents had an agreement on a place to gather during a disaster.

Based on data collected by researchers through questionnaires with early warning system parameters, it was stated that almost all respondents heard the landslide disaster announcement and followed the directions given by the village apparatus, most respondents knew the signs of landslide disaster danger by looking at rainfall or hearing announcements made by officers, almost all respondents lived in disaster-prone areas, almost all respondents needed to prepare communication tools during a disaster, almost all respondents were actively involved in disaster risk reduction preparation and planning meetings in their environment, and almost all respondents helped those closest to them if a disaster occurred.

Based on the data collected by researchers through a questionnaire with the parameter of the ability to mobilize resources, it states that most respondents know what to do when a landslide occurs, almost all respondents seek information on disaster preparedness, almost all respondents do not need to have savings or savings because if a disaster occurs it will be covered by the government, most respondents are involved in disaster preparedness seminars and training, most respondents conduct training and simulations of disaster warning systems, almost all respondents do not participate in simulations or evacuations in the event of a landslide, and most respondents monitor disaster preparedness tests regularly.

This is in line with previous research by (Rohimah et al., 2021) that there was an increase in the number of respondents' scores with a good level of knowledge after being given counseling on preparedness. The researcher argues that by being given Emergency Planning on landslides, it will increase knowledge about landslides and will form an attitude in community preparedness in facing landslides and in addition to good knowledge, a person must also have a good attitude because it will determine a person's readiness to act.

Based on the results of data analysis using the Wilcoxon test, the results of the sig value (2-tailed) pvalue: 0.0001 and the error rate (α): 0.05, so $p < \alpha$ so that H0 is rejected and H1 is accepted, meaning that there is an influence of Emergency Planning on community preparedness to face landslides in Besowo Village, Kediri Regency in 2022. The systematics in this study, namely the community in landslide-prone areas before being given Emergency Planning, showed that community preparedness was still relatively ready, this was due to the knowledge possessed by the community which was still lacking so that create a negative perception of preparedness (Hidayatush Sholikah et al., 2021). After being given Emergency Planning, the knowledge and perception of the community increased and they were more prepared to face landslides. Based on this, it shows that the provision of Emergency Planning is very much needed, especially for people living in disaster-prone areas (Badan Nasional Penanggulangan Bencana, 2016). The results above can be seen that the provision of Emergency Planning simulations greatly influences the formation of knowledge, attitudes towards emergency response plans, disaster warning systems and better community resource mobility or an increase in community preparedness in facing landslides. Researchers argue that by providing simulations, people understand better and people are better able to apply the information received so that knowledge and understanding increase which will be able to make perceptions positive, thus the community will be able to manage disaster risks in their environment and there will be quick and appropriate actions when a landslide occurs so that it can minimize victims and losses due to the landslide disaster.

This study addresses a crucial gap in disaster risk reduction by focusing on community preparedness through a simulation-based intervention. One of the study's key strengths lies in its relevance and direct applicability to real-world public health challenges. Targeting youth groups in landslide-prone villages, the study adopted a community-based approach aligned with participatory risk reduction strategies. The use of leaflets and emergency simulation exercises enhanced the practical learning experience for participants and contributed to improved knowledge and preparedness.

A single-group pre-test and post-test design was appropriate for assessing the immediate impact of the intervention. The inclusion of a comprehensive 36-item questionnaire covering four key domains—knowledge and attitudes, early warning systems, emergency response planning, and resource mobilization—added depth to the study. The Wilcoxon signed-rank test was appropriately applied to analyze changes before and after the intervention, and the results showed a statistically significant improvement in community preparedness.

Despite its strengths, this study has several limitations. Most notably, the lack of a control group limits the internal validity of the findings. Without a comparison group, it is difficult to rule out other external factors that may have influenced the improvement in preparedness.

CONCLUSION

Emergency Planning has an effect on Community Preparedness in Sidodadi Hamlet, Besowo Village, Kediri Regency. The results of this study highlight the importance of community-based emergency preparedness interventions in disaster-prone areas. Interventions such as health education

and simulations can be practical strategies for building disaster resilience at an early stage. Suggestions for future activities include involving a broader demographic beyond youth, including vulnerable populations such as adults and the elderly. Evaluations should examine preparedness outcomes over time and in different geographic and sociocultural contexts. It is also hoped that further researchers can use a research design using control and treatment groups (quasi-experimental design) so that the specifications of the differences between those given treatment and those not given treatment along with their supporting factors can be known.

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