

## Analysis of Public Knowledge Regarding Preparedness in Facing Earthquake Disasters

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### Abstract

**Background:** Earthquakes are one of the natural disasters that often occur in various countries. In 2023, there were 10,789 earthquakes in Indonesia with 54,652 fatalities.

**Method:** in the form of a *literature review* by collecting information taken from several journals in the form of primary data. The data obtained came from the *PubMed, NCBI, Google Scholar, Mendeley, ResearchGate, and Scopus databases* for the last 5 years based on keywords.

**Aim:** This article aims to improve community preparedness for earthquake disasters.

**Results:** Educational counseling and simulations carried out to foster public understanding of disaster preparedness are the right steps to build public awareness of the importance of disaster preparedness in accordance with established guidelines. Preparedness as stipulated in Law No. 24/2007 concerning Disaster Management is defined as a series of activities carried out to anticipate disasters through organizing with appropriate and efficient steps.

**Conclusion:** Increasing community capacity through appropriate health promotion will have an impact on the level of local community participation in understanding the importance of disaster preparedness, especially earthquakes in the area.

**Keywords:** Disaster, Earthquake, Preparedness, Counseling

### Introduction

Natural disasters are a global issue because they occur in most parts of the world. These natural disasters have a very large impact and risk on various dimensions of life, and threaten the survival of humans and other living things. Disasters generally do not

appear suddenly. Before a disaster occurs, there is a potential or threat known as a hazard. Disasters can be caused by factors originating from humans or from nature. Indonesia is a country that has a lot of potential for natural disasters on a fairly large scale because Indonesia is an archipelagic country located between the meeting of four world plates, namely the Eurasian Plate, the Indo- Australian Plate, the Pacific Plate and the Philippine Microplate. According to Kintpi (2019), this condition makes Indonesia vulnerable to earthquakes, tsunamis, volcanic eruptions, landslides, tornadoes and other types of geological disasters.<sup>1</sup>

Earthquakes are disasters that are prone to occur in Indonesia. Earthquakes are natural phenomena that occur due to plate shifts on the earth's surface. The characteristics of earthquakes are destructive, so that each incident usually causes losses, both material and immaterial.<sup>2</sup> The mechanism of the source of this earthquake is different from large earthquakes caused by megathrust faults or subduction. Earthquakes can generally be triggered by fluid, volcanic, or active fault activity.

In Indonesia, earthquakes that cause damage occur 3-5 times a year. Therefore, it is important to cluster the impact of earthquakes in Indonesia as an effort to mitigate disasters. The community needs to prepare themselves for earthquakes that are unknown when they will occur. Preparedness means planning actions to respond if a disaster occurs. Preparedness is also defined as a state of readiness in facing a crisis, disaster or other emergency.

Disaster management is a dynamic, integrated and sustainable process to improve the quality of steps related to handling, is a series of activities that include prevention, mitigation, preparedness, emergency response, rehabilitation and rebuilding. Disaster management is a series of efforts that include determining development policies that are at risk of disasters, disaster prevention activities, emergency response, and rehabilitation.<sup>3</sup> To deal with natural disasters, it is important for Indonesian people to increase awareness, knowledge and skills related to disaster mitigation. Many people still do not understand the causes of earthquakes and the steps that need to be taken when a disaster occurs.<sup>4</sup>

Community empowerment is the key to disaster management. Empowerment can be done through education and socialization to increase public awareness about disaster preparedness, especially earthquakes. Through these steps, it is hoped that the community will not only gain knowledge of preparedness but also become more resilient in facing future earthquakes. Most people still very dominantly maintain a culture of dependence

on government/private assistance, especially medical personnel, in dealing with these problems. The benefits that can be obtained from community empowerment are increased knowledge and skills of residents in handling disaster management.<sup>5</sup> A more aware and educated community will be better able to prepare themselves for disasters so that they can reduce the number of victims due to earthquakes.<sup>6</sup>

### **Research methods**

The method used in this study is a *literature review study*, which is a study conducted by analyzing selected literature from several sources with the aim of collecting and taking the core of previous research and analyzing several *overviews* of experts written in the text. Sources in this study were obtained from *PubMed*, *NCBI Google Scholar*, *Mendeley*, *ResearchGate*, and *Scopus* with a publication deadline in the last 5 years (2019-2024).

### **Results and Discussion**

An earthquake is a vibration or shock on the earth's surface caused by collisions between earth plates, active faults, volcanic activity or rock falls.<sup>1</sup> Earthquakes are a disaster that is prone to occur in Indonesia. Public understanding of disaster preparedness is the main key in post-disaster prevention and rehabilitation efforts.

According to Suradi et al.<sup>1</sup> in the book entitled *The Role of Disaster Preparedness Areas in Increasing Community Preparedness for Natural Disasters*, disaster management is a dynamic, integrated and sustainable process to improve the quality of steps related to handling, which is a series of activities that includes prevention, mitigation, preparedness, emergency response, rehabilitation and rebuilding. Disaster management is a series of efforts that include determining development policies that are at risk of disasters, disaster prevention activities, emergency response and rehabilitation.

Assessment of public knowledge regarding earthquake preparedness is presented in several existing studies. Ningsih et al.<sup>7</sup> stated community service activities were carried out in Malabero Village, Bengkulu City using a *questionnaire* to determine the level of knowledge of the Malabero Village community, Bengkulu City regarding earthquake disaster mitigation and preparedness. The results showed that the level of community knowledge before the outreach activities were carried out showed that 48.2% of community knowledge was still lacking regarding earthquake disaster mitigation and preparedness, whereas after the outreach using leaflet media, there was a significant

increase in community knowledge after receiving outreach regarding earthquake disaster mitigation and preparedness.

Furthermore, in the research conducted by Simandalahi et al.<sup>8</sup> material counseling was conducted for students in grades III and IV of SDN 12 Naras I, Pariaman City. The results showed that before the counseling, the average level of student knowledge was 4.4 and after the health counseling, the level of student knowledge became 6.9, where there was an influence of health education on earthquake disaster preparedness on student knowledge.

And in the socialization and simulation conducted by Daniyal et al.<sup>9</sup> the results showed that the level of community knowledge regarding earthquake preparedness during the pre-test or before socialization and simulation in the Keurisi Meunasah Lueng Village community was mostly at a moderate level, namely 62.5%, while the level of earthquake preparedness during the post-test or after socialization and simulation in the Keurisi Meunasah Lueng Village community was mostly at a high level, namely 86.1%. This shows a significant increase after socialization and simulation and is in line with Julianto's research (2019) which shows the influence of socialization on knowledge.<sup>11</sup> The simulation that was carried out also obtained results if there was an influence of socialization and simulation on preparedness in facing natural disasters such as earthquakes in the Keurisi Meunasah Lueng village community. Socialization and preparedness simulation are the key and main factors in making the community more prepared to face earthquakes.<sup>10</sup>

### **Community Preparedness**

According to the book *The Role of Disaster Preparedness Areas in Increasing Community Preparedness for Natural Disasters*, 2021. Preparedness comes from the basic word *siaga*. In the Big Indonesian Dictionary, "*siaga*" means a state of readiness; and *siap siaga* means ready to be used or ready to act. Therefore, "*kesiapsiagaan*" means a state of readiness, or as a state of readiness to act. Then in Law (UU) No. 24/2007 concerning Disaster Management, preparedness is defined as a series of activities carried out to anticipate disasters through organizing with appropriate and effective steps. Then according to Atmanand's view (2000) and Moe *et al* (2007) ; Suradi, et al. 2021. preparedness relates to activities and actions taken in advance to ensure an effective response to the impact of a hazard, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from the location.

Hidayati *et al* (2006) ; Suradi, et al. 2021, stated that there are five parameters that can be used to assess the level of community preparedness to anticipate disasters, namely:<sup>1,12</sup>

1. Knowledge of disaster risks held by the community will influence attitudes and concerns to be prepared and alert in anticipating disasters, especially for residents living in coastal areas that are vulnerable to earthquakes and tsunamis.
2. Policies and guidelines are concrete efforts to implement disaster preparedness activities. Policies and guidelines that affect preparedness include public education, emergency planning, disaster warning systems, and resource mobilization, including funding, management organizations, Human Resources (HR) and essential facilities for disaster emergencies. Policies can be expressed in various forms, but are more concrete if they are in the form of regulations, such as Decrees and/or Regional Regulations.
3. Emergency response plans are related to evacuation, aid and rescue so that disaster victims can be minimized. Various emergency response measures are very important to minimize casualties, especially when a disaster occurs from the first day to the third day before assistance arrives.
4. Disaster warning parameters that include warning signs and distribution of information about a disaster are no less important than other parameters. Early warning can reduce loss of life, property, and environmental damage. In this regard, training and simulation are needed on what to do when hearing a warning, where and how to save oneself within a certain time according to the location where the community is when a disaster occurs.
5. The parameters of resource mobilization, both human resources, funding, and important infrastructure for emergencies are potentials that can support preparedness. However, on the other hand, resource mobilization can also be an obstacle if mobilization cannot run well. Therefore, resource mobilization is a fairly important parameter of preparedness.

## **Conclusion**

Increasing community capacity through proper health promotion will have an impact on the level of local community participation in understanding the importance of disaster preparedness, especially earthquakes in the area, both independently and in groups. Increasing good understanding and knowledge about the important role of the community and community

preparedness for disasters is a major and key factor in preparing

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