

Building Disaster Preparedness: A Phenomenology Study among Community Nurses

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ABSTRACT

OBJECTIVE: To explore nurses' experiences and needs in improving disaster preparedness.

METHODOLOGY: This research is qualitative research with a phenomenological design. This study involved 32 health center nurses in West Sulawesi, selected through purposive sampling. Data were collected through a series of focus group discussions (FGD), with nurses grouped into four categories of eight people each until data saturation was achieved. The FGD guidelines were developed in consultation with experts in disaster nursing, disaster management, and health crisis management.

RESULTS: The results showed that the average age of the participants was 40.59 years, with an average work experience of 16.22 years. Further analysis obtained five themes: knowledge and attitudes, emergency plans, earthquake disaster warning systems, resource mobilization, and specialized training. These themes are further divided into 14 categories.

CONCLUSION: The study's findings underscore the need for practical actions to enhance nurses' disaster preparedness. The suboptimal levels of knowledge and attitudes, emergency plans, early warning systems, and resource mobilization among nurses call for the implementation of realistic disaster simulations tailored to their needs. These findings serve as a crucial foundation for the development of policies aimed at improving disaster preparedness competencies among nurses.

KEYWORDS: Disaster preparedness, early warning system, earthquake, emergency planning, emergency response, nursing

INTRODUCTION

Indonesia's location at the intersection of four major tectonic plates, the Eurasian, Indo-Australian, Philippine, and Pacific¹, poses challenges related to natural disasters such as earthquakes and floods²⁻⁴. Ranking third globally in disaster risk emphasizes the need for enhanced resilience and preparedness⁵. As of February 2024, a recent disaster had resulted in 30 fatalities, one missing person, 81 injuries, and 444,769 displaced individuals. The damage included 2,334 housing units, 208 schools, four places of worship, one office, and eight bridges. This highlights the importance of improving infrastructure and emergency response strategies to protect communities in the future⁶.

West Sulawesi, an autonomous region in Indonesia, is at high risk for disasters, with a risk score of 165.23 according to the 2022 Indonesia Disaster Risk Index¹. Frequent and unpredictable earthquakes pose

significant challenges⁷. On January 15, 2021, a magnitude 6.2 earthquake occurred at 2:28 AM WITA, 6 km northeast of Majene. On January 15, 2021, a magnitude 6.2 earthquake occurred at 2:28 AM WITA, 6 km northeast of Majene⁸. The earthquake caused 105 fatalities, 3,369 injuries, and 89,524 people to be displaced. Additionally, 7,922 buildings were damaged⁸. These earthquakes lead to extensive infrastructure damage and significant physical and psychological health impacts⁹.

Given the significant health impacts of earthquakes, a comprehensive disaster risk reduction strategy is crucial, involving all stakeholders, particularly healthcare providers¹⁰, and nurses, who are at the forefront of community interaction³. As key players in the healthcare system, nurses, one of the largest healthcare providers¹⁰, must be well-prepared to respond to disasters and crises. Their readiness is vital, as they work in health centers, providing primary healthcare and playing a pivotal role in the healthcare system^{4,8,10}.

The World Health Organization (WHO) stresses the importance of disaster preparedness across all health system sectors, including primary care¹¹. Despite being vital to disaster management, many nurses need to prepare more¹² in the category of nurse preparedness ranging from moderate to low¹³⁻¹⁷. Several studies in Indonesia also revealed similar results, where most nurses were considered still unprepared to respond to disaster situations. This is reflected in the lack of competence of Indonesia's nurses, especially in caring for disaster victims^{3,18,19},

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because the lack of training and previous experience in disaster relief is the most critical determinant^{3,16}. Lack of knowledge and skills of nurses in emergency response and disaster management is a common obstacle to nurses' preparedness to face critical situations^{4,12}. Many healthcare facilities are under-equipped, essential resources and services are often unavailable, and the heavy workload makes it difficult for nurses to respond effectively^{10,12,14,27}.

Nurses' hands-on experience in handling disasters plays an essential role in shaping risk perceptions and improving readiness to respond to emergencies, which can contribute to the effectiveness of disaster management^{10,20}. The study aims to identify earthquake preparedness based on the experience of Indonesian nurses to provide insights for more effective nurse planning and preparation in the future, given Indonesia's vulnerability to natural disasters and the vital role of nurses in emergency health services. Through the documentation of nurses' experiences, it is hoped that it can improve the readiness of the health system and resilience to face disasters to reduce risks and losses.

METHODOLOGY

Study Design

This research is a qualitative study using a descriptive phenomenological design³⁸. This design outlines the experience and needs of nurses in improving earthquake disaster preparedness in West Sulawesi, Indonesia.

Participants and Settings

This research focused on nurses impacted by the earthquake in West Sulawesi. Participants were selected through purposive sampling based on two criteria: they needed to express thoughts on earthquake disaster preparedness and communicate proficiently in Indonesian. Those not present during the earthquake were excluded. The study included 32 participants, divided into four focus group discussions of eight each. Data collection continued until no new information was obtained until saturation was reached²¹.

Instruments

The researcher developed interview guidelines for the study, initially based on the research objectives. These guidelines were reviewed by experts in disaster nursing, disaster management, and health crisis management. They were further revised after a preliminary focus group discussion with two participant groups.

Data Collection

Data were collected through focus group discussions (FGD) and field notes from March to May 2024. Four groups of nurses participated, with researchers acting as moderators and using open-ended questions to facilitate discussions on disaster preparedness. Each FGD lasted 45 to 60 minutes and was audio recorded. The main questions included: 1) Can you share your experiences during an earthquake disaster? 2) What

factors affect nurses' ability to provide optimal service during disasters? 3) What skills do nurses need for disaster response? 4) How can nurses' ability to cope with disasters be improved? 5) What are your expectations for reducing earthquake risk?

Data Analysis

The data were analyzed through content analysis²². Transcripts from each group were reviewed multiple times to categorize related concepts accurately. The principal researcher identified categories during data collection and analysis, while two co-authors verified coding consistency and the emergence of categories. They discussed and reached a consensus on the coding and critical findings.

RESULTS

The characteristics of the participants were average age (40.59±4.69) years, dominated by women (84.37%), all married, bachelor education (90.62%), and average working period (16.22±4.12) years (**Table I**). The study identified five themes and 14 categories. A detailed theme analysis is presented in **Table II**.

Table I: Characteristics of participants

Variable	Total (n = 13) n (%) or M ± SD
Age (years)	40.59±4.69
Gender	
Male	5 (1.63%)
Female	27 (84.37%)
Education	
Diploma	3 (9.38%)
Sarjana	29 (90.62%)
Marital status	
Married	32 (100 %)
Unmarried	
Working period (years)	1.22 ± 4.12

Table II: Analysis of the theme experiences and needs in improving disaster preparedness

Theme	Categories
Knowledge and attitude	1. Understanding earthquake disasters
	2. Understanding environmental vulnerability
	3. Understanding the capacity to anticipate earthquake disasters.
	4. Concern for the risk of earthquake disasters
Plans for emergencies	1. Evacuation plan
	2. Victim handling plan
	3. Emergency logistics plan
Earthquake disaster warning system	1. Traditional disaster warning system
	2. Technology-based disaster warning system
Ability to mobilize resources	1. Human resource mobilization
	2. Logistics mobilization
	3. Mobilization of infrastructure suggestions
Specific training development	1. Disaster management training
	2. Disaster emergency training

Theme 1: Knowledge and attitudes

This study showed that, despite limited resources, nurses lack adequate understanding and preparedness for earthquakes. Their commitment to victim care and relief efforts is evident, but enhancing their training and strengthening cross-sector coordination is essential for improving their role in disaster response. This could help foster peace, as illustrated by the following participant (P) quotes:

"Lack of knowledge (P11) and lack of experience in dealing with earthquake emergencies (P29) resulted in less than optimal preparation and response to the impacts of the earthquake disaster" (P27).

"The condition of earthquake victims in rural areas was exacerbated by the vulnerability to landslides (P3) and isolation due to disrupted communication networks (P7), hampering transportation access and aid delivery" (P12).

"Improving HR capacity through disaster management training is needed (P1) to optimize skills, logistics planning, coordination, and effective policy implementation in handling disaster victims" (P11).

"Preparing emergency equipment (P4) and setting up evacuation tents (P8), and even continuing to offer help despite limited conditions" (P17).

Theme 2: Plans for earthquake disaster emergencies

Earthquake disaster emergency plans need to be more robust. Some participants noted that problems like poor evacuation coordination, inadequate medical logistics, and slow aid distribution can hinder evacuation efficiency and post-disaster victim management.

"Directing people situationally to the fields without determining locations and gathering points (P18), no clear division of roles in moving victims to safe locations" (P5)

"Handling natural disaster victims was very difficult due to poor coordination (P11), lack of evacuation and distribution of emergency relief (P8), as well as limited medical equipment and difficulty meeting victims' logistical needs (P21)."

"Conditions at evacuation sites were difficult due to dwindling logistics supplies and slow distribution of aid (P22), coupled with still weak cross-sectoral coordination (P27)."

Theme 3: Earthquake disaster warning system

Two types of earthquake early warning systems were identified: traditional systems based on instincts and natural signs and modern technology-based systems, which can suffer from infrastructure damage that hinders rescue efforts, as noted by participant quotes:

"I felt a bad premonition that there would be aftershocks and the sea water receding (P9), falling rocks and tremors I experienced (P10)."

"At the time of the disaster, I had asked for help via SMS and Facebook (P4), I couldn't contact my family

because the network was down, and there were no adequate communication facilities, making it difficult to communicate for evacuating victims (P24)."

Theme 4: Ability to mobilize resources

In emergencies caused by disasters, swiftly mobilizing resources is essential for timely aid delivery. A shortage of medical personnel, volunteers, and limited infrastructure hinders treatment efforts and complicates rescue and post-disaster care for victims. Some participants reported:

"I joined as a nurse at the disaster post to help victims and opened a volunteer post (P5), although only followed by a limited ad-hoc team and inadequate human resources at the disaster site (P31)."

"Shortages of health logistics and food supplies at disaster sites, difficulties in mobilizing to meet victim needs (P31), slow and scrambling aid amid limited logistics (P23)."

"Limited infrastructure such as medical equipment, vehicles, and ambulances (P1) made it difficult to refer victims with lacerations to health facilities (P6), forcing the use of motor vehicles for evacuation (P15)."

Theme 5: Development of specific training

Nurses require special training to improve their preparedness, including basic disaster knowledge, risk mitigation, simulations, and victim evacuation skills. This training ensures they can respond effectively when disasters occur, as highlighted by the participants' feedback below:

"Special training, simulation, and experience are very important for nurses to minimize casualties during disasters (P8). Nurses need to learn disaster mitigation such as early tsunami warnings, post-earthquake actions, and simulation exercises to be prepared for real conditions (P15)."

"Emergency response training is important to prepare nurses to face disasters, equipping them with victim evacuation skills (P12), wound and fracture management (P14), and psychosocial support (P5)."

DISCUSSION

This study evaluates the level of earthquake preparedness among nurses in West Sulawesi, taking into account knowledge and attitude factors, emergency plans, earthquake disaster warning systems, resource mobilization, and special training. The study found that nurses have limited knowledge about earthquakes²³, which is essential for disaster preparedness and risk reduction²⁴. In addition, knowledge significantly influences attitudes^{19,25}, and a direct correlation exists between higher learning and more significant concern¹⁰. Training to improve knowledge and attitudes is necessary in disaster management practices²⁶.

The study underscores the importance of revising earthquake emergency plans for nurses. This revision can significantly enhance disaster management

capacity²⁷, leading to improved preparedness and minimized risk. Proper emergency planning, which involves coordinated protocols for disaster management²⁷, is crucial in this regard. Inadequate emergency management can lead to avoidable casualties and inefficiencies²⁸, making continuous planning a key aspect of disaster management²⁹.

The nurse earthquake warning system still relies on traditional methods, while applying technology-based systems could be more optimal. This is due to the lack of scientific and local knowledge integration, an essential element of disaster risk reduction³⁰. Emphasizing the role of technology in a comprehensive warning system is necessary, along with education, training, and increased risk awareness to improve preparedness and public understanding of disaster emergency response measures³¹.

The study highlights the need for improved resource mobilization among nurses during disasters. Challenges such as inadequate medical preparation, logistics, and equipment³² need to be addressed to strengthen emergency preparedness and ensure more efficient logistics planning³³. Difficulties in resource mobilization due to miscommunication, lack of transportation facilities, inefficient management, and disrupted logistics coordination³⁴ further underscore the need for improved resource mobilization. Strengthening emergency preparedness through stockpiling emergency supplies and building rapid response systems³⁵ is therefore crucial. This study emphasizes the importance of disaster management training for nurses. Appropriate education and training can improve nurses' ability to respond effectively to various disasters¹², improving knowledge, decision-making skills, teamwork, and adaptability in emergencies^{14,15}.

Clinical Implications

This research shows that enhancing nurses' disaster preparedness effectively reduces the negative impact of disasters. The findings support the development of policies and emergency response plans that actively involve nurses. Training to improve their skills is vital for minimizing risks and losses during disasters.

CONCLUSION

This study highlights the importance of readiness and competence in earthquake disaster response. Realistic simulation training for nurses is essential for improving their knowledge, attitudes, and emergency preparedness. The findings can help shape disaster response policies involving nurses. Further research is needed to develop a contextual disaster nursing training curriculum and evaluate training programs that sustainably enhance nurses' disaster management skills.

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AUTHOR CONTRIBUTION

Purnomo E: Conceptualized the study and drafted the initial reports

Hamid AYS: Created the research protocols and reviewed the manuscripts.

Gayatri D: Supervised data collection and contributed to the manuscript review

Setiawan A: Data analysis and prepared the final drafts.

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