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Research Article

Implementation of Disaster Preparedness in Hospitals by Emergency Department Nurses

Nyayu Nina Putri Calisanie^{1*} | Ramdani Ramdani² | Musopi Nuriyah¹

¹STIKep PPNI Jawa Barat,
Bandung, West Java –
Indonesia

²RSUD dr. Slamet Garut

*contact

nina.calisanie@gmail.com

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Abstract

Aims: The purpose of this study is to determine the preparedness of emergency room nurses in handling disasters in hospitals.

Method: This study employs a qualitative research design, utilizing a single case study that focuses on the implementation of disaster preparedness by emergency room nurses in hospitals. The subjects of this case study are two nurses who meet the inclusion criteria: they have attended disaster preparedness training, work as emergency room nurses, have been part of the hospital disaster team for at least five years, and are considered reliable and competent sources of data related to the research objective. Purposive sampling was used to select the participants, and data was collected through in-depth interviews guided by an interview protocol.

Results: Four themes were identified: disaster preparedness, the organizational structure of disaster management functions and tasks, patient grouping, and the communication of clear, effective information along with coordination among medical personnel.

Conclusion: The study found that implementing preparedness among emergency room nurses in disaster management is crucial to ensure a prompt and effective response in emergency situations.

Keywords:

Disaster Management, Disaster Preparedness, Emergency, Hospital, Nurses

INTRODUCTION

Indonesia, situated in a disaster-prone region, must prioritize disaster mitigation to effectively manage and reduce risks. The country experiences a high frequency of disasters due to natural factors (such as earthquakes and floods) and human activities (such as environmental degradation and industrial accidents). With a large population and an increasing number of reported disasters each year, effective disaster management has become essential to protect lives, livelihoods, and infrastructure (1).

According to Law No. 24 of 2007, a disaster is defined as a series of events caused by

natural or human factors that threaten lives, livelihoods, and well-being. Disasters can result in environmental destruction, material and non-material losses, and psychological impacts, many of which are influenced by human activities(2). All sectors, including healthcare, are vulnerable to the effects of disasters. Therefore, it is essential for hospitals to implement disaster management systems to ensure preparedness and effective response(3).

Between January 1, 2024, and May 27, 2024, 506 disasters were recorded in West Java, affecting 150,198 individuals, with 31 fatalities and 5,183 people displaced. RSHS (Hasan Sadikin Hospital) is one of the region's key referral hospitals. Following

the earthquake in Cianjur from November 22–29, 2022, RSHS received and treated 101 earthquake victims who required ongoing care (4).

Disaster preparedness in hospitals is a critical process to ensure that healthcare facilities are ready to manage emergencies effectively (5). This process involves addressing multiple dimensions, including structural, non-structural, and functional aspects, and is typically organized into several stages: planning, preparation, implementation, monitoring, and evaluation (6). Hospitals must ensure that all staff, particularly emergency department nurses, are well-trained and equipped to respond promptly and efficiently. As the first responders in hospital settings, emergency nurses play a vital role in disaster preparedness. Having the appropriate knowledge, skills, and attitudes enables them to minimize the impact of disasters on the affected population and support the recovery process (7).

While previous studies and policies emphasize the importance of disaster management in hospitals (8) several critical gaps remain in understanding the preparedness of healthcare personnel, particularly emergency department nurses, in disaster situations. Most existing literature focuses broadly on hospital disaster preparedness, structural protocols, or general disaster mitigation strategies (9,10). However, there is limited research exploring the specific knowledge, skills, and preparedness levels of emergency nurses, who are the first responders in medical emergencies (11). Additionally, few studies assess how well hospitals integrate disaster preparedness training across all dimensions—structural, non-structural, and functional—and how effective such training is in actual disaster scenarios ((12)).

Further, despite the high frequency of disasters in Indonesia, particularly in West Java, studies focusing on hospital preparedness within this specific context remain scarce. Existing literature often overlooks the perceptions of emergency

department nurses regarding their readiness to manage disaster situations, as well as the challenges they face during real-life responses (1). This creates a gap in understanding whether existing disaster management frameworks adequately prepare hospital staff for emergencies.

Thus, this study aims to address these gaps by evaluating the disaster preparedness of emergency room nurses in hospitals. It will provide insight into the effectiveness of their training and readiness, identify barriers to optimal performance, and suggest areas where further improvements are needed.

METHODS

Study Design

This study used a qualitative case study research design, which allows for an in-depth exploration of a specific phenomenon within its real-life context (13) The focus was on a single case study, examining the implementation of disaster preparedness in hospitals from the perspective of emergency room (ER) nurses. A single-case design is appropriate when the case represents a unique or critical example of the phenomenon being studied (14). This approach enabled a detailed understanding of the nurses' preparedness, experiences, and challenges in managing disaster situations within a hospital setting.

Sample

The subjects of this case study were two nurses, selected through purposive sampling. These nurses had attended disaster preparedness training, worked in the emergency room, had been part of a hospital disaster team for at least five years, and were considered reliable and competent sources of data relevant to the research objectives.

Data Collection

The research process was organized into three key phases: orientation, work, and termination. In the orientation phase, the


researcher began by obtaining informed consent, introducing themselves, and explaining the study's purpose and objectives. Upon the respondent's agreement to participate, the researcher confirmed their willingness and commitment. A time for the interview was established to ensure mutual availability, and permission was requested to record the interview with a cellphone audio recorder for transparency and respondent comfort.

During the work phase, the researcher began by inquiring about the respondent's general condition to build rapport, then followed the structured interview guide to keep the conversation focused and relevant. The researcher maintained continuous engagement, demonstrating active listening and creating a supportive environment. Each interview lasted between 40 to 60 minutes, with the researcher ensuring clear communication and comfort throughout.

In the termination phase, the researcher thanked the respondent for their participation and collaboration. A follow-up meeting was scheduled to address any data gaps and ensure validation. During this follow-up, the researcher revisited key points to align perceptions and, if needed, collected additional information to enhance data completeness and reliability.

Data analysis

The researcher processed the interview data and observations from the case study subjects using descriptive analysis and direct quotations, following established qualitative research procedures (15). First, the researcher documented the interview results with the nurses. Then, the interview recordings were transcribed verbatim to ensure the accuracy and completeness of the data ((16)). Next, the researcher coded the data by identifying recurring themes and patterns from the interviews, a crucial step in thematic analysis. Finally, categories were developed from the coded data, accompanied by relevant quotations from participants to provide evidence and illustrate key findings (17).

 <https://doi.org/10.33755/jkk>

RESULTS

This research focused on the implementation of disaster preparedness in hospitals by emergency nurses. Data collection took place through interviews conducted on May 28, 2024, at 14:00 WIB, involving two emergency room (ER) nurses as respondents. The participants included Mr. R, a senior nurse with 24 years of experience, and Mr. S, a staff nurse with approximately 10 years of experience. Both participants willingly consented to participate in the interviews after the researcher explained the study's purpose. The interviews were audio-recorded using a cellphone to ensure accuracy and completeness.

The analysis of the interview data with the two participants revealed 26 significant meanings, which were further categorized into five sub-themes and four overarching themes. This structured approach provided a comprehensive understanding of the participants' perspectives on disaster preparedness in hospital settings.

Theme 1: Disaster preparedness

Based on the data collected, there is disaster preparedness by emergency room nurses. The ER nurses revealed that when an external disaster occurs, they must be prepared for the possibility of being dispatched, such as the question below:

"Ready or not, if we are needed we must be ready to go, even though it could be anytime and anywhere..." (P1)

"For example, the one in Cianjur is also the one in Cianjur which might be Cianjur, so if we hear that there is a disaster somewhere we are already prepared..." (P1)

"We were often sent there during the tsunami, I was there for a month then went to Bantul, Yogyakarta, Irian, then Pangandaran, the Pangandaran tsunami was small at that time, so be prepared, you have to be prepared..." (P1)

"If there is an external disaster, then the emergency room nurses are ready, but again, it all depends on the leadership's policy..." (P2)

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"For example, if there is a disaster, it will happen in a certain area and then a signal or alarm will be given in this group regarding the disaster, blah blah blah blah... Okay, for this, prepare for the possibility of being sent ..." (P1)

Theme 2: Organizational Structure of Disaster Management Functions and Duties

Based on the collected data and data analysis, two sub-theme categories were obtained, consisting of; 1) emergency response coordination, 2) organizational structure of disaster management functions and tasks.

Subtheme 1: Emergency response coordination

This subtheme explains who the disaster coordinator is, as in the statement below:

"Okay, for the diagram, if we are in the ER, we already have it, so for mm, I happen to be the one who is, uh, the term is disaster coordinator. If you look at the organizational structure, I happen to be the disaster case handling team, both on the internet and outside, so what am I doing in the ER ..." (P1)

Subtheme 2: Organizational structure, functions and tasks of disaster management

The second sub-theme explains the organizational structure and functions of disaster management, as in the statement below:

"I happened to be part of the organization's disaster case handling team, both on the internet and outside, so I was in the emergency room ..." (P1)

"The function of the task, the function is one, yes, if the function of the organization or the function of the organizational structure is to make coordination easier, yes ..." (P1)

"coordination of each section or as eee Persian term is checking... checking goods or tools that are likely to be needed ..." (P1)

"Yes, usually we coordinate directly with the pharmaceutical department for example for medical devices and medicines and maybe we also coordinate with other installations ..." (P1)

"As far as I know, the organizational structure of its functions and duties is basically that if there is a nurse who is on leave, they will be called to leave, usually consisting of several nurses and doctors and maybe also pharmacists..." (P2)

"Here we are forming a team, and I am coordinating with all the related departments here in terms of patient acceptance for disasters ..." (P1)

"The team in the sense of its task is to function as patient data collection, data collection of patients who are included here, victims ..." (P1)

Theme 3: Patient Grouping

Based on the data collected, the IGD nurse said that the patient grouping is with the ATS (Australasian Triage Scale) system, disaster victim patients come to the IGD and then patient selection will be carried out using the triage method. General patients and disaster victim patients will be separated as stated below:

"Then, for the handling, the handling of cases is adjusted to the category, we use a triage system, using the ATS system, which is in accordance with category one to category five ..." (P1)

"But what is clear is that for disaster cases, after they have been sorted, we will try to separate them from ordinary general patients ..." (P1)

"So to make it easier for us to identify them so they don't get mixed up with other patients like that..." (P1)

"Nurses who come to disaster areas usually prioritize patients with yellow or red labels who are referred to RSHS ..." (P2)

Theme 4: Delivering Information Clearly and Effectively and Coordinating Between Medical Personnel

Based on the data collected, it was found that the IGD nurses coordinated with medical personnel and also public relations to convey information, such as the statement below:

"Umm, we'll communicate later, we're not standing alone here, we'll coordinate with the public relations department ..." (P1)

"We will always coordinate with the public relations department, there will be a section for that, so we won't immediately give information to the family, okay..." (P1)

"The communication is the same as when we are in the emergency room, the handling is already there, then to use this communication, what actions have been taken, have they been taken, have they not been taken, usually we are given an observation sheet every time we leave..." (P2)

DISCUSSION

The results of in-depth interviews with participants regarding disaster preparedness indicated that Hasan Sadikin Hospital in Bandung is prepared to respond to external disasters at any time, given its status as a referral center hospital. However, the effectiveness of disaster preparedness is heavily influenced by leadership policies. According to research by Setyawati 2020(18)), the pre- and post-disaster management phases involve critical roles for the command and planning teams. During an emergency response, all hospital employees are expected to fulfill their roles to ensure smooth operations, highlighting the importance of clear job descriptions for all staff members, including those at lower levels. This aligns with the findings of al khailaileh, 2012 (9), who emphasized that role clarity and effective coordination are essential in disaster preparedness to minimize confusion among hospital personnel (19).

A related study by Nurochman et al. (2019) found that Hajj Hospital is well-prepared for emergencies because employee performance improves significantly through regular training programs. The study highlights that training activities enable employees to acquire new skills, helping them perform their tasks more professionally and efficiently. These findings emphasize the need for hospitals to invest in human resource development through continuous training (10). Furthermore, Gebbie and Qureshi (2019)

concluded that well-trained staff exhibit higher confidence and competence during disaster responses (20). The management standard used in these hospitals includes two parameters, consisting of 12 and 3 indicators, respectively. While all indicators for the second parameter meet the standard, two indicators under the first parameter fail to meet the benchmarks (21)

Further interviews on disaster management structures at Hasan Sadikin Hospital revealed that a disaster management team and an organizational structure with defined roles and responsibilities are already in place(22). However, some nurses reported unawareness of their roles within the disaster management team, suggesting that the structure needs periodic updates and socialization to ensure team members understand their responsibilities (18). This aligns with research by Prasetyo et al. (2021), who noted that clear communication and regular training improve teamwork and inter-departmental coordination.

Regarding patient grouping during disasters, Hasan Sadikin Hospital employs the ATS system to triage disaster victims separately from general patients upon arrival at the emergency room. This approach aligns with findings from Yarsi Hospital Bukittinggi, which uses triage systems based on emergency severity levels. While Yarsi Hospital provides adequate first aid facilities, the study also identified a shortage of human resources during large-scale emergencies, emphasizing the need for staffing plans (21). Research by Hammad et al. (2012) similarly highlights that hospitals often experience staff shortages during disaster scenarios, which can compromise care quality.

Additionally, Hasan Sadikin Hospital ensures routine communication through observation sheets, allowing staff members to track actions taken during emergencies. The public relations team also plays a crucial role in coordinating external

disaster information. Effective communication is essential for successful disaster response, as noted by Prasetyo et al. (2021)(23). Communication tools, such as microphones, radios, mobile phones, and telephones, are vital for coordinating efforts. However, the use of these tools is inconsistent, with some disaster response team members failing to utilize handy-talkie (HT) radios during operations. (24,25) This finding aligns with the recommendations from RSI Ibnu Sina Yarsi Bukittinggi, suggesting that organizational structures should be more effectively socialized and that additional human resources should be allocated to communication systems to enhance preparedness ((10)(26).

CONCLUSION

In conclusion, this study found that the preparedness of emergency room nurses in disaster management is crucial for ensuring a quick and effective response to emergency situations. With adequate training and preparation, nurses can provide optimal care to disaster victims, enhance patient safety, and minimize potential negative impacts. The results of this study identified five themes: 1) disaster management preparedness, 2) organizational structure of disaster management functions and tasks, 3) patient grouping, 4) clear and effective communication, and 5) coordination among medical personnel.

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