

ANALYSIS OF NURSES PREPAREDNESS AS THE FIRST LINE OF DISASTER EMERGENCIES AT TYPE C REGIONAL HOSPITAL

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ABSTRACT

Indonesia is known as a region with a high risk of natural disasters. In such emergency situations, nurses often serve as the frontline responders. However, several studies have revealed that there are still deficiencies in their preparedness for such events. This study aims to evaluate the level of disaster preparedness among nurses in Type C regional general hospital, particularly in terms of knowledge and skills, as well as the influencing factors. A quantitative descriptive approach was employed, involving 43 nurses as respondents. The research instrument was a questionnaire developed based on the Disaster Preparedness Evaluation Tool (DPET). The level of nurse preparedness was categorized as moderate, with an average score of 3.27 (SD = 0.49). In terms of knowledge, nurses scored an average of 3.49 (SD = 0.53), while skill scores averaged 3.21 (SD = 0.53). Nurses working in the emergency department (ED) demonstrated the highest level of preparedness. No significant relationship was found between preparedness and gender, age, or education level. However, nurses with more than five years of work experience tended to have better preparedness ($p = 0.028$). The findings indicate the need to enhance nurses' skills in disaster response through continuous training and simulation. In addition, periodic rotation across work units may serve as an additional strategy to enrich experience and improve nurses' readiness in emergency situations.

Keywords : disaster management; disaster nursing; hospital readiness; general hospital; nurses' preparedness

INTRODUCTION

Indonesia ranks among the countries with the highest disaster risk. This is due to its geographic location within the Asia-Pacific Ring of Fire. The National Disaster Management Agency (BNPB) recorded 2,107 natural disasters in Indonesia in 2024. This situation demands health services with a high level of preparedness in responding to disasters. In almost all hospitals in Indonesia, nurses typically play a strategic role as the first line of disaster preparedness. The involvement of nurses is not only due to their greater numbers compared to other professions, but also because nurses are involved in various stages of disaster management, from mitigation and preparedness to immediate response and recovery. Unfortunately, several studies have found that the level of preparedness of nurses in Indonesia for disasters is not yet as expected. One study conducted in Lampung Province revealed that nurses' practical skills in disaster response are still inadequate and require skill improvement through training. (Tiara & Thongkrajai, 2019)

Type C hospitals are generally the first point of reference for disaster response in districts or small cities. Nurses often face various obstacles in disaster preparedness. These obstacles are generally related to staffing, inadequate facilities, and limited access to skills development. Several studies have shown that limited knowledge, the absence of effective contingency plans, and inadequate

training are the main factors contributing to nurses' low disaster preparedness (Suprayitno et al., 2020).

However, other studies have shown that formal educational background and work experience do not influence disaster preparedness. The factor that does show a significant relationship is the frequency of disaster training or simulations (Nada & Kamaluddin, 2020). Furthermore, other findings indicate that even though nurses have attended basic training and conducted disaster simulations, their understanding of overall disaster management remains inadequate. This suggests that current training has not been sufficient to improve nurses' disaster preparedness (Herawati & Farosyah, 2023).

Although nurses in Type C regional general hospitals are the first line of staff, disaster preparedness still faces many challenges. Therefore, this study aimed to analyze nurses' disaster preparedness at Type C regional general hospitals, which serve as the first line of emergency response.

Disaster preparedness in nursing encompasses the effectiveness of nurses' responses to various emergency situations resulting from disasters, including mitigation, preparedness, immediate response, and rehabilitation. The majority of nurses working in referral hospitals in disaster-prone areas have only a moderate level of disaster preparedness, despite the majority having undergone basic training and disaster simulations (Herawati & Farosyah, 2023). At Prambanan Regional Hospital, a positive correlation was also found between nurses' participation in Hospital Disaster Plan simulations and their level of disaster preparedness (Nada & Kamaluddin, 2020).

A study involving 1,481 respondents found that many nurses lack comprehensive knowledge of the stages of a disaster, both in emergency response and recovery (Martono et al., 2019). Meanwhile, other research has shown that participating in simulations and understanding hospital contingency plans positively impacts nurses' perceptions of their competence in disaster management (Winarti & Gracia, 2023).

The primary focus of previous research has been on type A and type B referral hospitals in coastal areas or high-risk disaster areas (Bahlail et al., 2024). There is limited research literature focusing on type C hospitals, which generally have limited resources. Furthermore, previous research has generally been limited to a descriptive approach without delving deeper into the relationships between variables such as length of service and work units. This lack of data makes it difficult for hospitals to develop strategic disaster preparedness plans based on local data (Prima & Meliala, 2017). Therefore, it is hoped that this article can make a real contribution to the development of disaster preparedness policies, especially for type C hospitals with limited resources (Zeth et al., 2022).

Previous research generally used survey techniques in the form of Disaster Preparedness Evaluation Tools (DPET). One study demonstrated that the DPET was valid for implementation in Indonesia, with the results showing that related variables such as education level, knowledge, and skills had a well-explained correlation with disaster preparedness (Setyawati et al., 2020). A similar approach was also used in research in Lampung province, which focused on flood and earthquake preparedness (Tiara & Thongkrajai, 2019).

METHODS

This study uses a quantitative descriptive approach that uses a survey as a way of collecting data to describe the level of preparedness of nurses in facing disasters at Type C Regional General Hospital. This approach is used because it has the ability to provide a numerical and objective representation of population characteristics based on the variables studied, namely the aspects of nurses' knowledge and skills and their relationship with nurses' preparedness and response to disaster situations (Jilcha Sileyew, 2020). The study was conducted from January to March 2025 at the Type C Regional General Hospital in North Lampung Regency.

The data used are primary data collected directly from participants through the distribution of closed questionnaires. The information collected covers several aspects, including: participant demographics and elements of disaster preparedness (knowledge and skills, and their relationship to disaster preparedness). The questionnaire instrument was developed based on the Indonesian version of the Disaster Preparedness Evaluation Tools (DPET-I), which has been adapted and validated in the local context (Nugroho et al., 2017). The DPET instrument contains statements assessed using a five-point Likert scale (very unprepared to very prepared), to provide a comprehensive picture of nurses' preparedness in facing disaster emergencies.

Data collection was conducted through a survey using an online questionnaire distributed over a two-week period. To ensure the validity and clarity of the instrument, back-translation and pilot testing were conducted on ten nurses outside the main sample (Nugroho et al., 2017). All respondents were required to provide informed consent before being granted access to complete the questionnaire. Data were collected anonymously to ensure confidentiality and comply with research ethics.

The inclusion criteria in this study were nurses who: (1) had worked actively for at least 1 year at the regional hospital where the study was conducted, (2) were willing to participate voluntarily, (3) were not on leave or outside assignments. Meanwhile, the exclusion criteria were nurses who: (1) were still in work orientation, (2) had inactive status, (3) had completed the questionnaire incompletely. These criteria were intended to obtain a sample of nurses who had adequate understanding and work experience regarding the service system and operational dynamics of the hospital (Winarti & Gracia, 2023).

The unit of analysis in this study was individual nurses who performed clinical duties in various service units at a type C regional general hospital, such as inpatient service units, emergency departments (ERs), intensive care units (ICUs), and polyclinics. From a total population of 173 nurses, 43 were selected as research samples randomly using the *proportional random sampling method* from each work unit. This method was chosen to ensure proportional representation of each work unit and to minimize potential bias in respondent selection (Etikan, 2017).

The data in this study were processed through descriptive analysis, presenting frequency distributions, percentages, and average values for each aspect of preparedness, namely knowledge, skills, and their relationship to preparedness. The entire process was analyzed using SPSS 21 software. This application was also used to test the internal reliability of the instrument using Cronbach's Alpha calculations. Meanwhile, to test the relationship between variables, the Spearman (Kaliyadan & Kulkarni, 2019) correlation test was used. Interpretation of findings is carried out by referring to the level of readiness category (low, medium, or high) which is

determined based on the average score value for each aspect, according to the approach used in previous research on type A and type B hospitals in Indonesia (Nada & Kamaluddin, 2020).

All research procedures have received ethical approval from the relevant health research ethics committee and were conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The study was also conducted based on the principle of respecting the confidentiality of respondents' identities, ensuring voluntary participation and protecting them from any potential harm that could occur to them (Jennifer Barrow et al., 2022).

RESULT AND DISCUSSION

This study involved 43 respondents who were randomly selected from a population of 173 nurses working at a Type C Regional General Hospital. All respondents met the inclusion criteria and completed the questionnaire. Based on demographic characteristics, the majority of respondents were female (76.7%), had vocational education (58.1%), were aged between 26 and 35 years (51.2%), and had worked for >5 years (55.8%). Based on work units, respondents came from the Emergency Department (ER) (27.9%), the ICU (16.3%), and others (11.6%).

Nurses' disaster preparedness was measured using three main aspects: knowledge, skills, and their relationship to preparedness, measured using a five-point Likert scale. Descriptive analysis showed that the overall average preparedness score was 3.27 with a standard deviation of 0.49, which is considered moderate. The highest score for each aspect was knowledge, with a score of 3.49 (SD=0.53), and the highest score was for skills, with a score of 3.11 (SD=0.42). This finding aligns with the research of Setyawati et al. (2020), which found that practical skills are often the weakest component of nurses' disaster preparedness.

The distribution of preparedness levels by category shows that 58.1% of respondents were in the moderate category, 23.2% of respondents were in the high category, and 18.6% were in the low category. More specifically, it was found that in terms of knowledge, 30.2% of nurses demonstrated a high level of preparedness; however, in terms of skills, only 18.6% of nurses were in the high category. This is in line with research conducted by Winari and Gracia (2023), which indicated that nurses' conceptual understanding of disasters is generally better than their mastery of technical aspects and field practice in disaster preparedness.

Of all respondents, only 41.9% had received formal disaster management training. Nurses who had received training demonstrated a higher level of preparedness, with an average score of 3.51, compared to nurses who had not received training (an average score of only 3.09). This aligns with the findings of Nada et al.'s (2020) study, which indicated that participation in Hospital Disaster Plan simulations significantly contributed to improving nurses' technical preparedness in facing disasters.

The Spearman correlation test results showed a significant relationship between participation in disaster training and skills ($r=0.423$; $p<0.01$), but surprisingly, there was no significant correlation between training and knowledge ($r=0.211$; $p=0.162$). This indicates that disaster training tends to have a greater impact on developing operational capabilities. This is in line with research by Suprayitno et al. (2020) which stated that the availability of training and infrastructure support are important factors influencing nurses in facing disasters.

Analysis by work unit showed differences in the level of nurse preparedness. Respondents working in the emergency department (ER) had the highest score, with an average score of 3.49. ICU nurses had an average score of 3.37; inpatient units had an average score of 3.19; and other units had an average score of 3.07. These differences indicate that work units play a role in nurses' disaster preparedness. Similar findings were reported by Herawati (2019) in another study.

Further research revealed no significant correlation between gender, education level, and age group. However, there was a significant relationship between length of service and nurses' disaster preparedness. Nurses with more than five years of service demonstrated statistically higher scores ($p=0.028$). This finding aligns with research by Zeth et al. (2022), which found that work experience and self-confidence are closely related to individual disaster preparedness. The overall research results show variations in the level of disaster preparedness of nurses at Type C Regional General Hospitals, with an overall moderate trend. Knowledge ranks higher than skills. Several variables significantly related to nurses' disaster preparedness include training, work unit, and work experience. This finding is supported by research by Martono et al. (2018), which emphasizes the crucial role of continuing education in strengthening disaster preparedness among nursing staff in Indonesia.

The research results revealed that the level of disaster preparedness of nurses at Type C Regional General Hospitals was in the moderate category, with the highest score in the knowledge aspect. This finding directly addresses the research problem formulation and primary objective: to evaluate nurses' disaster preparedness from two perspectives (knowledge and skills). Several variables in this study, such as disaster training, work unit, and work experience, were significantly associated with increased disaster preparedness.

This study still has shortcomings that require attention. The small sample size ($n=43$), although selected using proportional sampling techniques, limits the generalizability of the findings to other Type C Regional General Hospitals, which may have different geographic and demographic conditions. Another limitation is the cross-sectional study design, which does not allow for causal relationships between variables and relies on self-reporting, which is susceptible to respondent perception bias.

Despite limitations, the study's findings offer practical value for hospital management and healthcare policymakers. Based on this research, hospital leaders can develop locally-based disaster training programs, emphasizing cross-unit simulations. Future researchers can develop hands-on training intervention models and test them using a quasi-experimental design. Furthermore, a qualitative approach is needed to explore nurses' personal experiences when responding to disasters.

Furthermore, recommendations are directed to national policy makers in the health sector to consider allocating a special budget to support the implementation of disaster training at Type C Regional General Hospitals. In addition, preparedness modules need to be integrated into the nursing professional education curriculum as expressed by Martono et al (2018) who identified the still weak preparedness content in the nursing education system in Indonesia.

CONCLUSION

This study found that the disaster preparedness of nurses at Type C Regional General Hospitals was at a moderate level, with knowledge scoring higher than skills. Although the majority of nurses understood the basic concepts of disaster management, participation in disaster training and simulations was minimal, resulting in low levels of preparedness. Nurses working in units with a high frequency of emergencies had higher levels of preparedness. Nurses with a high level of service experience typically had high self-confidence, making them better prepared for disasters. The main contribution of this article is the expansion of scientific insight regarding nurse preparedness in Type C Regional General Hospitals. From a theoretical perspective, this study strengthens the validity of the Disaster Preparedness Evaluation Tool (DPET) as an effective instrument for measuring multidimensional preparedness. From a practical perspective, this article provides a strong argumentative foundation for hospital management and policymakers to design disaster training programs that are local, based on contextual data, and oriented towards improving the operational capacity of nursing staff.

Future researchers are advised to use longitudinal or experimental designs to assess the effectiveness of repeated training on improving nurses' preparedness over time. Furthermore, integrating qualitative approaches would be helpful in deepening our understanding of barriers and nurses' subjective perceptions regarding preparedness practices in the field.

REFERENCES

- Bahlail, R., Somantri, I., & Mulya, A. P. (2024). Core Competencies in Disaster Nursing among Nurses at a General Hospital in Coastal Areas. *Media Keperawatan Indonesia*, 7(3), 193. <https://doi.org/10.26714/mki.7.3.2024.193-201>
- Etikan, I. (2017). Sampling and Sampling Methods. *Biometrics & Biostatistics International Journal*, 5(6). <https://doi.org/10.15406/bbij.2017.05.00149>
- Herawati, T., & Farosyah, A. (2023). Kesiapsiagaan Bencana Perawat di Rumah Sakit Rujukan pada Area Rentan Bencana di Indonesia: Studi Deskriptif Analitik. In *Journal of Bionursing* 128 *Journal of Bionursing* (Vol. 5, Issue 2).
- Jennifer Barrow, A. M., Brannan, G. D., & Khandhar Affiliations, P. B. (2022). *Research Ethics*. <https://www.ncbi.nlm.nih.gov/books/NBK459281/?report=printable>
- Jilcha Sileyew, K. (2020). Research Design and Methodology. In *Cyberspace*. IntechOpen. <https://doi.org/10.5772/intechopen.85731>
- Kaliyadan, F., & Kulkarni, V. (2019). Types of variables, descriptive statistics, and sample size. *Indian Dermatology Online Journal*, 10(1), 82–86. https://doi.org/10.4103/idoj.IDOJ_468_18
- Martono, M., Satino, S., Nursalam, N., Efendi, F., & Bushy, A. (2019). Indonesian nurses' perception of disaster management preparedness. *Chinese Journal of Traumatology - English Edition*, 22(1), 41–46. <https://doi.org/10.1016/j.cjtee.2018.09.002>
- Nada, Q., & Kamaluddin, R. (2020). Hubungan Hospital Disaster Plan Simulation dengan Kesiapsiagaan Bencana Perawat Di RSUD Prambanan Kabupaten Sleman. *Jurnal of Bionursing*, 2(2), 86–93. <https://doi.org/https://doi.org/10.20884/BION.V2I2.46>
- Nugroho, agung, Alim, S., & Danu, S. S. (2017). *Uji Validitas dan Reliabilitas Disaster preparedness Evaluation Tool Indonesian Version (DPET-I)*. <https://etd.repository.ugm.ac.id/penelitian/detail/114229>

- Prima, A., & Meliala, A. (2017). Hambatan dan Peluang Dalam Pembuatan Hospital disaster Plan : Studi Kasus dari Sumatera Utara. *Berita Kedokteran Masyarakat (BKM Journal of Community and Public Health)*, 33(12), 595–602. <https://jurnal.ugm.ac.id/bkm/article/view/27301/20564>
- Setyawati, A. D., Lu, Y. Y., Liu, C. Y., & Liang, S. Y. (2020). Disaster Knowledge, Skills, and Preparedness Among Nurses in Bengkulu, Indonesia: A Descriptive Correlational Survey Study. *Journal of Emergency Nursing*, 46(5), 633–641. <https://doi.org/10.1016/j.jen.2020.04.004>
- Suprayitno, G., Ahsan, & Mintaroem, K. (2020). Preparedness of members of the indonesian emergency and disaster nurses association. *International Journal of Public Health Science*, 9(4), 393–398. <https://doi.org/10.11591/ijphs.v9i4.20500>
- Tiara, & Thongkrajai, earmpoi. (2019). GAMBARAN TINGKAT PENGETAHUAN PERAWAT TERHADAP PENANGGULANGAN BENCANA DI PROVINSI LAMPUNG THE DESCRIPTION OF NURSES KNOWLEDGE ON DISASTER MANAGEMENT IN LAMPUNG PROVINCE. *Jurnal Kesehatan*, VIII, 75–79.
- Winarti, W., & Gracia, N. (2023). Exploring Nurses' Perceptions of Disaster Preparedness Competencies. *Nurse Media Journal of Nursing*, 13(2), 236–245. <https://doi.org/10.14710/nmjn.v13i2.51936>
- Zeth, A. H. M., Suprayitno, G., Rahayu, E. S., & Sulistiyan, S. (2022). Self-Efficacy and Emergency Preparedness in Indonesia. *Open Access Macedonian Journal of Medical Sciences*, 10(G), 270–274. <https://doi.org/10.3889/oamjms.2022.8485>

