Nursing Skills in Handling Earthquakes and the Implications for Nursing Education: A Narrative Review

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Abstract

Many countries have high earthquake activities. As an integral part of the emergency response team, nurses play a critical role in disaster management. This review aimed to identify nurses' skills in dealing with earthquakes and their implications for the importance of nurse education in this area. This study used a narrative review. The literature was searched using three databases: CINAHL, PubMed, and Scopus, using the keywords "Nurses OR Nurse OR Personnel Nurses OR Registered Nurses AND Clinical Competence OR Competency, Clinical OR Clinical Skill AND Earthquakes." The analysis was carried out descriptively and qualitatively using a thematic analysis approach. The resultsshows that eight studies were analyzed in this review. Nursing competency in earthquake disasters includes skills and knowledge important for preparing, responding to, and recovering from pre- and post-disaster conditions. The results of this research classify nurses' skills into five categories: knowledge of disaster management, clinical skills and patient care, protective measures and safety leadership, communication and coordination, and psychological and social support. Conclusion: The review results highlight the importance of increasing nurses' skills through training and knowledge in disaster preparedness for nurses, emphasizing a deep understanding of emergency medical management and post-disaster recovery. The importance of adapting nursing education curricula and using effective teaching strategies to ensure that nurses have sufficient skills and knowledge to face complex disaster challenges.

Keywords: Clinical competence, disaster management, nursing skills.

Abstrak

Banyak negara yang memiliki aktivitas gempa bumi yang tinggi. Perawat, sebagai bagian integral dari tim tanggap darurat, memegang peranan penting dalam penanggulangan bencana. Tinjauan ini bertujuan untuk mengidentifikasi keterampilan perawat dalam menangani gempa bumi dan implikasinya terhadap pentingnya pendidikan perawat dalam menangani gempa bumi. Metode penelitian ini menggunakan kajian naratif. Penelusuran pustaka menggunakan tiga basis data, yaitu CINAHL, PubMed dan Scopus dengan menggunakan kata kunci "Nurses OR Nurse OR Personnel Nurses OR Registered Nurses AND Clinical Competence OR Competency, Clinical OR Clinical Skill AND Earthquakes". Analisis dilakukan secara deskriptif kualitatif dengan pendekatan *thematic analysis.* Hasil menunjukkan bahwa terdapat delapan penelitian yang dianalisis dalam tinjauan ini. Kompetensi keperawatan dalam menangani bencana gempa bumi mencakup berbagai keterampilan dan pengetahuan yang penting untuk mempersiapkan, menanggapi dan memulihkan kondisi pra-intra-pascabencana. Hasil penelitian ini mengklasifikasikan keterampilan perawat menjadi lima kategori: pengetahuan tentang penanggulangan bencana, keterampilan klinis dan perawatan pasien, tindakan perlindungan dan kepemimpinan keselamatan, komunikasi dan koordinasi, dukungan psikologis dan sosial. Disimpulkan bahwa hasil kajian menyoroti pentingnya peningkatan keterampilan yang harus dimiliki perawat melalui pelatihan dan pengetahuan dalam kesiapsiagaan bencana bagi perawat, dengan penekanan pada pemahaman mendalam tentang manajemen medis darurat dan pemulihan pascabencana. Pentingnya mengadaptasi kurikulum pendidikan keperawatan dan menggunakan strategi pengajaran yang efektif untuk memastikan bahwa perawat memiliki keterampilan dan pengetahuan yang cukup untuk menghadapi tantangan bencana yang kompleks.

Kata kunci: Gempa bumi, keterampilan keperawatan, kompetensi klinis, manajemen bencana.

Introduction

Natural disasters pose a significant threat to human life, infrastructure and the stability of societies worldwide. Earthquakes are one of the most devastating disasters, often resulting in significant losses of life and property (Kishore et al., 2018). The unpredictable nature of earthquakes makes them very difficult to anticipate, leaving communities vulnerable to the impacts of sudden disasters (Borella et al., 2016). Despite progress in disaster preparedness and response, earthquakes cause massive loss of life globally.

In recent years, the frequency and severity of natural disasters, including earthquakes, have increased, increasing the number of fatalities (Allen et al., 2018). World disaster data highlights a 35% increase in disaster events between 2016 and 2017, which underlines the importance of strengthening disaster resilience measures (Kishore et al., 2018). In the context of natural disasters, earthquakes are one of the most frequently occurring disasters, covering 16% of total disaster events worldwide. (Liu et al., 2021). The impact of earthquakes on human life is enormous; millions of people are affected, and thousands of people lose their lives yearly (Sangkala & Gerdtz, 2018).

The impact of earthquakes causes casualties and affects various aspects of human life, including physical, economic and psychological (Allen et al., 2018; Gray et al., 2019; Mohebi et al., 2018). Physical injuries and health complications arise directly from earthquake events, placing enormous pressure on a healthcare system grappling with infrastructure damage (Kishore et al., 2018). In addition, the economic impact is enormous, disrupting livelihoods and hampering access to important services such as health services and clean water.

Facing a crisis like this, health workers, especially nurses, have an important role in disaster response and mitigation efforts (Ayuningtyas et al., 2021). Recognizing the importance of nursing expertise in disaster management, the International Council of Nurses (ICN) emphasizes its indispensable role in reducing the impact of disasters (Yan et al., 2015). Nurses are on the front lines of providing healthcare services to affected populations (Hasan et al., 2021), from immediate triage and first aid to long-term patient care and rehabilitation.

Nursing response in an earthquake situation depends on the readiness and competence of nursing professionals (Hasan et al., 2021; Rezaei et al., 2020). Professional nurses are expected to be able to apply Evidence-Based Nursing (EBN) in the nursing process (Bahlail et al., 2024). Adequate knowledge and skills in disaster management are essential for nurses to effectively navigate the complexities of earthquake response (Alzahrani & Kyratsis, 2017; Gray et al., 2019; Öztekin et al., 2016). However, several studies show gaps in disaster

preparedness among nurses facing disaster situations, which has the potential to endanger the safety and welfare of health service providers and disaster survivors (Alzahrani & Kyratsis, 2017). Facts on the ground show that many nurses have not received specific training related to disaster management, such as on-site triage, handling of serious injuries, and psychological trauma care (Farokhzadian et al., 2024; Kimin et al., 2021). In addition, the lack of simulations or routine exercises to deal with disasters often makes nurses less confident in carrying out their roles (Emaliyawati et al., 2025), so can also support patient safety goals (Nurhanifah et al., 2021). This condition is further exacerbated by the lack of explicit operational guidelines and adequate resource support during a disaster (Kimin et al., 2021). Therefore, it is important to conduct an in-depth review to identify the need for education and training related to nursing skills in handling disaster situations.

These challenges make it important to identify nurses' preparedness in responding to earthquakes and areas that need improvement. To explore the competency of nurses in earthquake management and the implications for nursing education, which aims to improve disaster preparedness in the nursing profession by explaining the roles and challenges faced by nurses in responding to earthquakes, the importance of conducting literature searches through narrative reviews to provide strategic information and strengthen nurses' abilities and to optimize the delivery of health services in disaster situations.

Method

The design used was a narrative review. This review used PRISMA (Reporting for Systematic Reviews and Meta-Analysis) in literature reviews to find these articles.

The article eligibility process uses the PCC approach (Population, Concept, Context):

P (Population): Nurses

C (Concept): Nurse's clinical competency

C (Context): Role of Nurses in Handling Earthquake

The inclusion criteria in this review are full-text articles that can be accessed and published in English, articles with qualitative or quantitative designs, and articles published within 10 years (2014-2024). The author also excluded articles that were not accessible, not in English, grey literature, and abstracts.

All authors selected studies that met the eligibility criteria. In the initial stage, they checked for duplication using Mendeley's reference manager. Then, they checked the title, abstract, and full text to determine their relevance to the research topic and inclusion and

exclusion criteria. Therefore, the articles analyzed in this review have been based on eligibility criteria.

The databases used to search for articles consist of three databases: CINAHL, PubMed, and Scopus. Keywords are combined using the boolean operators OR and AND. The keywords used are "Nurses OR Nurse OR Personnel Nurses OR Registered Nurses AND Clinical Competence OR Competency, Clinical OR Clinical Skill AND Earthquakes."

In the data extraction process, all researchers involved in this research work collaboratively to ensure the accuracy and completeness of the information taken from the studies analyzed. Data extraction in this research used a tabular form to describe all results related to the topic discussed. The table contains data related to author, year, country, type of disaster, research design, sample, nurse skills and findings. This data extraction table was created to make it easier for authors to describe the review results.

Results

The literature search found a total of 33 articles from 3 different sources, including PubMed (3), Scopus (17), and CINAHL (13). Of this number, the process of eliminating duplicates was five articles, and the articles did not meet the initial criteria based on 20 titles and abstracts, resulting in a reduction of 25 articles. Eight articles were selected for further analysis.
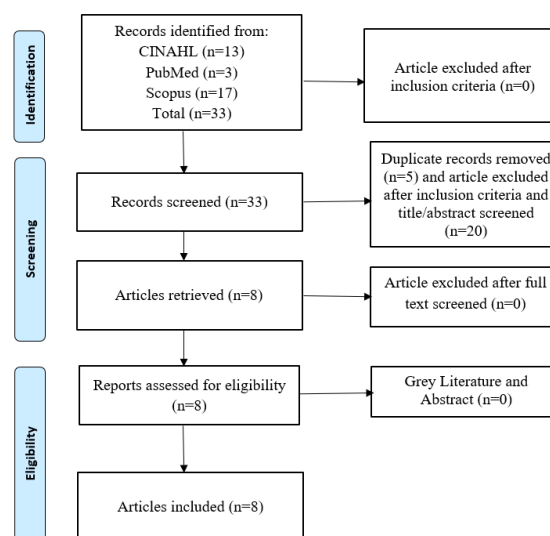

Figure 1. PRISMA Diagram Flow

In this review, there are several types of articles published, including descriptive comparison design, cross-sectional design, qualitative design and mixed-method design,

which were carried out in several developing and developed countries, such as Indonesia (n=1), Bangladesh (n=1), Spain (n=1), Japan (n=1), Iran (n=2), China (n=1), Turkey (n=1) and USA (n=1). These countries are located around the Ring of Fire and have high earthquake activity. All research respondents ranged from 16 to 1,320 nurses (See Table 1).

Table 1. Data Extraction

Authors, Year	Country	Design	Sample	Nursing Skills	Result
(Martono et al., 2019)	Indonesia	Descriptive Comparison Design	1.320 Indonesian nurses	1. Preparedness and Understanding of the Nurse's Role 2. Rapid Response, Disaster Recovery and Evaluation	The preparedness of Indonesian nurses in disaster management needs to be improved. This requires increased training programs and continuing education to equip nurses with the necessary skills and knowledge.
(Hasan et al., 2021)	Bangladesh, Spain	Cross-sectional survey method	410 nurses'	1. Leader and Management Skills 2. Use PPE 3. Triage and Emergency Care 4. Psychosocial Support Skills 5. Health Assessment and Intervention Skills 6. Preparedness and Post-Disaster Care 7. Knowledge of Disaster Management Protocols	These skills underscore the role of nurses in disaster preparedness and response and the importance of comprehensive training and education to enhance disaster management capacity.
(Öztekin et al., 2016)	Japan	Cross-sectional	All nurses in 6 Japanese Hospitals	1. Disaster Knowledge 2. Triage and Use PPE 3. Family Preparedness for Disaster 4. Knowledge-Spesific Response 5. Patient Management During Response 6. Recovery Knowledge and Management	Nurses feel underprepared to deal with various disaster situations. Although they know a disaster emergency plan in their workplace, they are not confident implementing it.
(Rezaei et al., 2020)	Iran	A Qualitative Study	16 nurses	1. Managing Crush Syndrome Patients 2. Controlling Bleeding 3. Cardiopulmonary Resuscitation (CPR) 4. Providing care across different age ranges. 5. Communication Skills, Resiliency and creativity-innovation providing care 6. Ethical Competence 7. Triage 8. Psychological Care Skills	The four categories include clinical competence, personal competence, ethical competence, and key skills in caring for victims.

Authors, Year	Country	Design	Sample	Nursing Skills	Result
				9. Skills in Observation and Monitoring	
(Far et al., 2020)	Iran	Cross-sectional	230 nurses	Knowledge Disaster Management	This study highlights the need for increased training and educational initiatives focused on disaster preparedness.
(Yan et al., 2015)	China	Mixed-Method	139 Nurses	1. Specific Disaster Nursing Training 2. Haemostasis, bandaging, fixation, manual handling, observation and monitoring, debridement and dressing, and mass casualty transportation. 3. Psychological Care	This study provides contributions and insights into the competency of nurses in earthquake disasters.
(Ediz & Yanik, 2023)	Turki	Descriptive study	All nurses working at the Ministry of Health	Psychological Resiliency	This study provides insight into the skills and attributes required by nurses that lead to nurses' perception, psychological resilience, and empathic abilities.
(Gray et al., 2019)	USA	Descriptive study with the Angoff method	23 nurses	1. Patient Identification 2. Reducing Thermal Losses 3. Use PPE 4. Supporting Respiratory Needs 5. Effective Communication 6. Assessment Environment	This study emphasizes that managing patient physiology, such as thermoregulation, infection control, respiratory support, and monitoring, is an important skill every nurse must master.

Nursing Competency in Earthquake Disaster

In this review, nursing competency in dealing with earthquake disasters includes skills and knowledge important for preparing, responding and recovering from pre-intra-post disaster conditions (Rezaei et al., 2020). Several studies that have been identified report that nursing competency in earthquake disaster situations is essential to ensure effective and efficient treatment of disaster victims (Hasan et al., 2021; Rezaei et al., 2020). Martono et al. (2019) emphasized increasing training and continuing education programs to prepare Indonesian nurses to face earthquake disasters. Preparedness and understanding of the role of nurses, as well as rapid response, disaster recovery, and evaluation, are the main focus of increasing the capacity of nurses in disaster management. This shows the urgent need to strengthen nursing education with material related to disaster management.

Hasan et al. (2021) concluded that leadership and management skills in PPE, triage and emergency care, psychosocial support, health assessment and intervention, and knowledge of disaster management protocols are important components of nurse competency. This research highlights that the role of nurses is not only limited to medical treatment but also involves aspects of effective coordination and communication in disaster situations. Meanwhile, Öztekin et al. (2016) and Rezaei et al. (2020) show that nurses are often less prepared to deal with disasters. Even though they know emergency plans, they need specific training in disaster knowledge, triage, use of PPE, family preparedness, patient-specific responses and post-disaster recovery. This study emphasizes the need for nurses to have a broad understanding and applicable abilities in disaster management.

Far et al. (2020) and Yan et al. (2015) show the need for improvements and educational initiatives focusing on nurses' knowledge, attitudes and performance regarding disaster management. Expanding the scope of disaster nursing training, nurses can be equipped with better capabilities in emergency management, psychological care and evacuation-transportation of disaster victims. Ediz and Yanik (2023) and Gray et al. (2019) identified additional skills such as psychological resilience, empathy, disaster patient identification, hyperthermia management, respiratory labour support, effective communication and environmental assessment competencies that nurses must possess. This confirms that nursing competency in earthquake disasters includes not only technical aspects of medical care but also psychosocial and communicative aspects, which enable nurses to provide holistic support to disaster victims.

Developing and strengthening nursing competency in earthquake disasters requires a multidimensional approach that includes technical training, developing communicative and psychosocial skills, and an in-depth understanding of disaster management. Nurses can contribute significantly to disaster response and recovery through continuous education and training.

Table 2. Category of Nursing Skills in Disaster Management

Classification	Nursing Skills	Study
Knowledge of Disaster Management	1. Preparedness and Understanding of the Nurse's Role 2. Rapid Response, Disaster Recovery and Evaluation 3. Preparedness and Post-Disaster Care 4. Knowledge of Disaster Management Protocols 5. Knowledge-Spesific Response 6. Recovery Knowledge and Management 7. Specific Disaster Nursing Training	(Martono et al., 2019; Hasan et al., 2021; Öztekin et al., 2016; Far et al., 2020; Yan et al., 2015)

Classification	Nursing Skills	Study
Clinical Skills and Patient Care	1. Managing Crush Syndrome Patients 2. Controlling Bleeding 3. Cardiopulmonary Resuscitation (CPR) 4. Haemostasis, bandaging, fixation 5. Debridement and dressing 6. Psychological Care Skills 7. Health Assessment and Intervention Skills 8. Skills in Observation and Monitoring 9. Reducing Thermal Losses 10. Supporting Respiratory Needs 11. Triage and Emergency Care 12. Mass casualty transportation 13. Patient Identification	(Hasan et al., 2021; Öztekin et al., 2016; Rezaei et al., 2020; Yan et al., 2015; Gray et al., 2019)
Protective Measures and Safety	1. Use of Personal Protective Equipment 2. Family Preparedness for Disaster	(Hasan et al., 2021; Öztekin et al., 2016; Gray et al., 2019)
Leadership, Communication and Coordination	1. Leadership and Management Skills 2. Communication Skills 3. Assessment Environment	(Gray et al., 2019; Rezaei et al., 2020)
Psychological and Social Support	1. Psychosocial Support Skills 2. Psychological Care 3. Psychological Resiliency 4. Patient Management During Response	(Hasan et al., 2021; Yan et al., 2015; Ediz & Yanik, 2023)

Discussion

An earthquake is a geological event within the earth's crust, which can cause earth shifts, vibrations and other effects. Earthquakes can occur due to various factors, including tectonic movements, volcanic activity, and human activity. Earthquakes can occur anywhere with different magnitudes, so their impacts vary, resulting in loss of life, injuries, psychological trauma, and infrastructure damage. The earthquake disaster management activities include prevention, mitigation, preparedness, emergency response, and recovery related to the disaster carried out before, during, and after the disaster.

Based on the findings in this review, various nurse competencies were found related to the skills that must be possessed as a front line in handling earthquake disaster management. This literature also shows that developed and developing countries have the same problem, namely, the role of nurses in earthquake disaster management is not yet optimal. This is due to nurses' lack of knowledge and competence, so they are not prepared to face disasters inside or outside the hospital. The importance of basic education, continuing education, and special training related to disaster management.

Leadership, Communication and Coordination Skills

Several studies report that professional nurses must have leadership qualities so that planning, community preparation to face disasters, and wisdom in decision-making is carried out (Gray et al., 2019; Hasan et al., 2021; Martono et al., 2019; Öztekin et al., 2016; Rezaei et al., 2020). Öztekin et al. (2016) reported that nurses can provide health promotion to

increase public awareness of critical earthquake conditions through educational programs related to earthquake first aid to avoid losses and prevent physical and psychological trauma. Apart from that, when a disaster occurs, The nurses must be able to adapt and provide solutions with innovation and creativity (Rezaei et al., 2020) and make decisions (Gray et al., 2019).

Gray et al. (2019) explained the role of nurses during an earthquake, as well as after a disaster, in dealing with critical conditions; they must maintain effective communication with the team, for example, in evacuating patients to anticipate emergency problems and therapeutic communication with victims to build trust. In addition, Far et al. (2020) explain the obstacles to implementing leadership skills, namely lack of knowledge regarding earthquake disasters and handling each stage. Apart from that, there is a lack of confidence in handling disasters due to the lack of continuous education and training from hospitals (Hasan et al., 2021; Martono et al., 2019).

Clinical Skills and Patient Care

Professional nursing practitioners must have clinical skills to contribute during disasters and after earthquakes to ensure survival, minimize complications and disability and reduce mortality rates (Far et al., 2020). Previous studies have explained that the clinical skills of nurses during disasters are triage, cardiopulmonary resuscitation, observation and assessment of conditions, controlling bleeding, controlling infection, dealing with shock, fixation and debridement, transportation and evacuation of referral services, documentation and protection of at-risk groups (Gray et al., 2019; Rezaei et al., 2020; Yan et al., 2015). Hasan et al. (2021) and Öztekin et al. (2016) stated that the obstacles to implementing clinical skills were the lack of facilitated workplace training, refreshing knowledge regarding earthquake management guidelines or protocols from hospitals, lack of experience, and physical fatigue.

Lack of facilities when an earthquake occurs in critical conditions also inhibits nursing intervention and endangers victims, requiring critical thinking to find solutions (Rezaei et al., 2020). This is also explained by Martino et al. (2019), Öztekin et al. (2016) and Yan et al. (2015) that the importance of nurses' knowledge about earthquakes will help to increase confidence in carrying out more effective disaster response actions in critical conditions. Basic nursing education is needed in a disaster management curriculum, and special training in sustainable disaster management is facilitated by the hospital where you work.

Psychological and Social Support Skills

Ediz and Yanik (2023) and Rezaei et al. (2020) explained that nurses with psychological resilience skills will help provide empathetic services to earthquake victims. In Ediz and Yanik (2023) revealed that having psychological resilience positively impacts the development of skills such as self-confidence, autonomy, coping and adapting to situations, and it creates a life force that motivates nurses. Rezaei et al. (2020) state that nurses who adapt to the environment and patient conditions will be responsible and prepared when a disaster occurs. The research also states that nurses who have empathy, such as understanding towards victims who are experiencing anxiety and grief, will carry out the role of mitigation and quick response with joy to improve the quality of service. However, Ediz and Yanik (2023) revealed that nurses are still unable to handle psychological trauma due to a lack of experience and management training when a disaster occurs.

Protective Measures and Safety Skills

To overcome the earthquake disaster, nurses as professionals providing health services need to have special skills in terms of protective measures and safety. Nurses must pay attention to themselves and their safety when providing assistance and assistance (Gray et al., 2019; Öztekin et al., 2016; Rezaei et al., 2020). Gray et al. (2019) also found that personal protective equipment (PPE) is essential for nurses involved in disaster training activities and evacuation efforts, especially when handling babies in critical condition. Using PPE during disasters highlights the importance of crucial elements such as face masks, gloves, and hand sanitizer. This shows that nurses need to receive adequate training regarding the use and packaging of PPE and selecting appropriate cleaning materials, which are very important for nurses to reduce the risk of infection during the evacuation process.

Knowledge of Disaster Management Skills

Nurses' training, knowledge and experience greatly influence dealing with disasters. Nurses who have experience and training in disaster management show better abilities in disaster management compared to those who do not have experience and training. Additionally, nurses with more than a decade of nursing experience generally demonstrate better disaster management skills than those with less experience (Martono et al., 2019). A significant positive correlation was seen between nurses' disaster knowledge and disaster management skills and between disaster knowledge and disaster preparedness. In addition, there is a moderate positive correlation between nurses' disaster skills and disaster preparedness (Hasan et al., 2021).

Nurses have a significant function in disaster preparedness by participating in activities such as providing public education to reduce disaster risks and participating in disaster response efforts. Nurses need to have the necessary competencies in disaster preparedness and disaster management. Despite this, existing literature suggests that nurses often lack the preparedness level necessary to effectively handle disaster-related tasks (Martono et al., 2019).

Conclusions

Earthquake disasters can occur in any part of the world and at any time, regardless of developed or developing countries. As professionals from the nursing cluster, nurses have an important role in preparing to face this. Several nursing skills identified in this review include knowledge of disaster management, clinical skills and patient care, protective measures and safety, leadership, communication and coordination and psychological and social support. Nurses need special skills in dealing with disasters to be effective and efficient in helping disaster victims. The suggestions for nursing education need to strengthen training and education aspects in disaster preparedness and training in psychosocial support and communication in dealing with post-disaster.

References

Allen, J., Brown, L. M., Alpass, F. M., & Stephens, C. V. (2018). Longitudinal health and disaster impact in older New Zealand adults in the 2010-2011 Canterbury earthquake series. *Journal of Gerontological Social Work*, *61*(7), 701–718. https://doi.org/10.1080/01634372.2018.1494073

Alzahrani, F., & Kyratsis, Y. (2017). Emergency nurse disaster preparedness during mass gatherings: A cross-sectional survey of emergency nurses' perceptions in hospitals in Mecca, Saudi Arabia. *BMJ Open*, *7*(4). https://doi.org/10.1136/bmjopen-2016-013563.

Ayuningtyas, D., Windiarti, S., Hadi, M. S., Fasrini, U. U., & Barinda, S. (2021). Disaster Preparedness and Mitigation in Indonesia: A Narrative Review. *Iranian Journal of Public Health*, *50*(8), 1536–1546. https://doi.org/10.18502/ijph.v50i8.6799.

Bahlail, R., Somantri, I., & Nurhakim, F. (2024). *Perubahan Pengetahuan Perawat Sebelum dan Setelah Diberikan Pendidikan Evidence-Based Nursing melalui Video Conference Media Karya Kesehatan : Volume 7 Issue 2 Nov 2024 Pendahuluan Sebagai salah satu profesi dalam pelayanan kesehatan , perawat melakukan anamnesis , kepada kliennya (Togubu et al ., 2019). Untuk dapat menunjang setiap proses tersebut , perawat profesional diharapkan dapat mengaplikasikan asuhan berbasis bukti atau Evidence Based Practice (EBP) dalam proses keperawatan sehingga klien mendapatkan kualitas asuhan yang optimal (Mark & Patel , 2019 ; Noprianty , 2019 ; Purssell & Mccrae ,*

2020) . EBP adalah satu cara penggunaan asuhan . Mayoritas perawat memiliki keyakinan bahwa EBP memberikan dampak positif terhadap biasa disebut Evidence Based Nursing (EBN) merupakan suatu upaya untuk meningkatkan kualitas asuhan keperawatan melalui integrasi praktik keperawatan dengan pilihan bukti terbaik yang mendasarinya . EBN memberikan dampak positif terhadap level kepuasan pasien , semangat kerja ilmiah agar dapat memberikan perawatan dengan menggunakan hasil riset terbaik , memecahkan dengan keahlian klinis terhadap klien dan melakukan evaluasi respon klien secara subjektif maupun akreditasi institusi pelayanan kesehatan dan jenjang karir perawat itu sendiri (Noprianty , 2019). keperawatan . Hal ini disebabkan oleh sibuknya pelayanan , burnout (Kowalczuk et al ., 2020), dan Media Karya Kesehatan : Volume 7 Issue 2 Nov 2024. 7(2), 216–229.

Borella, P., Bargellini, A., Marchegiano, P., Vecchi, E., & Marchesi, I. (2016). Hospital-acquired Legionella infections: An update on the procedures for controlling environmental contamination. *Annali Di Igiene Medicina Preventiva e Di Comunita*, *28*(2), 98–108. https://doi.org/10.7416/ai.2016.2088.

Ediz, Ç., & Yanik, D. (2023). Disaster preparedness perception, pyschological resiliences and empathy levels of nurses after 2023 Great Turkiye earthquake: Are nurses prepared for disasters: A risk management study. *Public Health Nursing (Boston, Mass.)*, *41*. https://doi.org/10.1111/phn.13267.

Emaliyawati, E., Ibrahim, K., Trisyani, Y., Nuraeni, A., Miladi, Q. N., Abdillah, H., Christina, M., Riandi, D., Sutini, T., Emaliyawati, E., Ibrahim, K., Trisyani, Y., Nuraeni, A., & Sugiharto, F. (2025). Tabletop Disaster Exercises : A Scoping Review of Benefits for Health Workers and Students Enhancing Disaster Preparedness Through Tabletop Disaster Exercises : A Scoping Review of Benefits for Health Workers and Students. *Advances in Medical Education and Practice Open*, *16*, 1–11. https://doi.org/10.2147/AMEP.S504705.

Far, S. S. T., Marzaleh, M. A., Shokrpour, N., & Ravangard, R. (2020). Nurses' Knowledge, Attitude, and Performance about Disaster Management: A Case of Iran. *The Open Public Health Journal*, *13*(1), 441–446. https://doi.org/10.2174/1874944502013010441.

Farokhzadian, J., Mangolian Shahrbabaki, P., Farahmandnia, H., Taskiran Eskici, G., & Soltani Goki, F. (2024). Nurses' challenges for disaster response: a qualitative study. *BMC Emergency Medicine*, *24*(1), 1. https://doi.org/10.1186/s12873-023-00921-8.

Gray, M. M., Thomas, A. A., Burns, B., & Umoren, R. A. (2019). Identifying Crucial Equipment and Skills Needed to Evacuate Critically Ill Infants during Disasters: Using Nursing Expertise to Guide Training Targets. *Prehospital and Disaster Medicine*, *34*(4), 370–375. https://doi.org/10.1017/S1049023X19004473.

Hasan, M. K., Younos, T. B., & Farid, Z. I. (2021). Nurses' knowledge, skills and preparedness for disaster management of a Megapolis: Implications for nursing disaster education. *Nurse Education Today*, *107*(August), 105122. https://doi.org/10.1016/j.nedt.2021.105122.

Kimin, A., Nurachmah, E., Lestari, F., & Gayatri, D. (2021). Factors affecting nurses' ability to provide effective care in a disaster response: a review. *Journal of Public Health*

Research, *11*(2). https://doi.org/10.4081/jphr.2021.2732.

Kishore, N., Marqués, D., Mahmud, A., Kiang, M. V., Rodriguez, I., Fuller, A., Ebner, P., Sorensen, C., Racy, F., Lemery, J., Maas, L., Leaning, J., Irizarry, R. A., Balsari, S., & Buckee, C. O. (2018). Mortality in Puerto Rico after Hurricane Maria. *New England Journal of Medicine*, *379*(2), 162–170. https://doi.org/10.1056/nejmsa1803972.

Liu, T., Liu, X., Li, Y., Liu, S., & Cao, C. (2021). Evolving Trends and Research Hotspots in Disaster Epidemiology From 1985 to 2020: A Bibliometric Analysis. *Frontiers in Public Health*, *9*, 720787. https://doi.org/10.3389/fpubh.2021.720787.

Martono, M., Satino, S., Nursalam, N., Efendi, F., & Bushy, A. (2019). Indonesian nurses' perception of disaster management preparedness. *Chinese Journal of Traumatology*, *22*(1), 41–46. https://doi.org/https://doi.org/10.1016/j.cjtee.2018.09.002.

Mohebi, S., Parham, M., Sharifirad, G., & Gharlipour, Z. (2018). Social Support and Self - Care Behavior Study. *Journal of Education and Health Promotion*, *10*, 1–6. https://doi.org/10.4103/jehp.jehp.

Nurhanifah, N., Kamil, H., Syahrul, S., Marlina, M., & Marianthi, D. (2021). The Relationship between Nurse's Characteristics and Motivation with the Implementation of International Patient Safety Goal. *Media Karya Kesehatan*, *4*(2), 252–267. https://doi.org/10.24198/mkk.v4i2.34665.

Öztekin, S. D., Larson, E. E., Akahoshi, M., & Öztekin, İ. (2016). Japanese nurses' perception of their preparedness for disasters: Quantitative survey research on one prefecture in Japan. *Japan Journal of Nursing Science : JJNS*, *13*(3), 391–401. https://doi.org/10.1111/jjns.12121.

Rezaei, S. A., Abdi, A., Akbari, F., & Moradi, K. (2020). Nurses' professional competences in providing care to the injured in earthquake: A qualitative study. *Journal of Education and Health Promotion*, *9*, 188. https://doi.org/10.4103/jehp.jehp_214_20.

Sangkala, M. S., & Gerdtz, M. F. (2018). Disaster preparedness and learning needs among community health nurse coordinators in South Sulawesi Indonesia. *Australasian Emergency Care*, *21*(1), 23–30. https://doi.org/10.1016/j.auec.2017.11.002.

Yan, Y. E., Turale, S., Stone, T., & Petrini, M. (2015). Disaster nursing skills, knowledge and attitudes required in earthquake relief: Implications for nursing education. *International Nursing Review*, *62*(3), 351–359. https://doi.org/10.1111/inr.12175.