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DISASTER LITERACY FACTORS IN NURSES: A LITERATURE REVIEW

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ABSTRAK

Disaster literacy among nurses is essential to enhance disaster preparedness and management capabilities. As the frontline responders during emergencies, nurses must possess adequate knowledge, skills, and readiness both physically and mentally. However, research exploring factors influencing disaster literacy remains limited. This study aims to identify the determinants of disaster literacy in nurses by reviewing findings from various relevant studies. A literature review approach was employed, analyzing nine articles focusing on nurses' disaster literacy. The selected articles included research on nurses' experiences in disaster situations, disaster-related nursing education, and the role of organizational support in strengthening literacy. Thematic analysis revealed several key factors influencing disaster literacy: formal education on disaster preparedness, direct involvement in disaster response, simulation-based training, and supportive managerial environments. The findings highlight the need for a multidimensional approach that integrates technical competencies, emotional resilience, and social awareness to develop comprehensive disaster literacy. Nurses who regularly participate in simulation and training programs show significantly higher levels of preparedness and confidence in handling emergencies. Strengthening disaster literacy requires policies that encourage continuous education and practical exercises. Future studies are recommended to investigate effective simulation models and organizational strategies that can sustainably improve nurses' disaster preparedness.

Keywords: *Disaster Literacy, Nurses, Preparedness, Simulation Training, Organizational Support*

Introduction

In recent decades, natural and non-natural disasters such as earthquakes, floods, pandemics, and fires have increased significantly in various parts of the world, including Indonesia. The

increase in the intensity and frequency of these disasters requires health preparedness, especially nurses, as the spearhead of first-line services (Artini et al., 2022; Bakri, 2020). Nurses are not



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only required to have clinical skills, but also the capacity to understand, respond to, and mitigate the impact of disasters professionally and effectively (Al Thobaity, 2024; Farokhzadian et al., 2024). The 2023 National Disaster Management Agency (BNPB) report showed that more than 70% of disasters in Indonesia were not accompanied by adequate health service system readiness (Fitrianingrum et al., 2023), including the lack of training and knowledge of nursing staff in disaster management. This condition reinforces the urgency of strengthening disaster literacy in nurses as an integral part of the resilience of the national health system.

Disaster literacy in nurses has become an important topic in various global nursing studies. Zhang (2024) identified nine main dimensions of disaster literacy in nurses, ranging from information literacy to leadership and knowledge transformation (Zhang, Zhang, Zhang, Zhang, et al., 2024a). Another study by Yang (2024) suggested that factors such as collectivism, social support, psychological resilience, and self-efficacy have a significant relationship to the level of disaster literacy in nurses (Yang et al., 2024). Hung also found that nursing students' perceptions of disaster safety can be grouped into several types, ranging from national responsibility to educational orientation (M. S. Hung et al., 2020; M. S. Y. Hung et al., 2021). These findings indicate that disaster literacy is not a single ability, but rather a collection of various multidimensional competencies influenced by psychological, social, and educational factors. Therefore, it is

important to summarize and comprehensively analyze the various literatures that discuss the aspects that form disaster literacy in nurses.

This study is important because the increasing complexity and frequency of disasters demand that nurses possess integrated competencies that go beyond clinical and technical skills alone. In Indonesia, where more than 70% of disasters are not accompanied by adequate health system preparedness, disaster literacy becomes an urgent necessity to ensure an effective first-line response. The ability of nurses to understand, anticipate, and manage disasters professionally has direct implications for community safety and the resilience of the health system. Despite growing attention to this topic, most previous studies have explored disaster literacy only partially, often focusing on a single aspect, such as disaster training or psychological readiness, without integrating different dimensions that influence literacy comprehensively. Therefore, research that systematically examines the multifactorial nature of disaster literacy in nurses is needed to support evidence-based educational strategies, optimize disaster preparedness programs, and strengthen policy interventions within health institutions.

The novelty of this study lies in its interdisciplinary and cross-country approach, which synthesizes findings from qualitative, quantitative, and exploratory studies to build a more holistic understanding of disaster literacy determinants in nurses. Unlike prior studies that have typically applied a



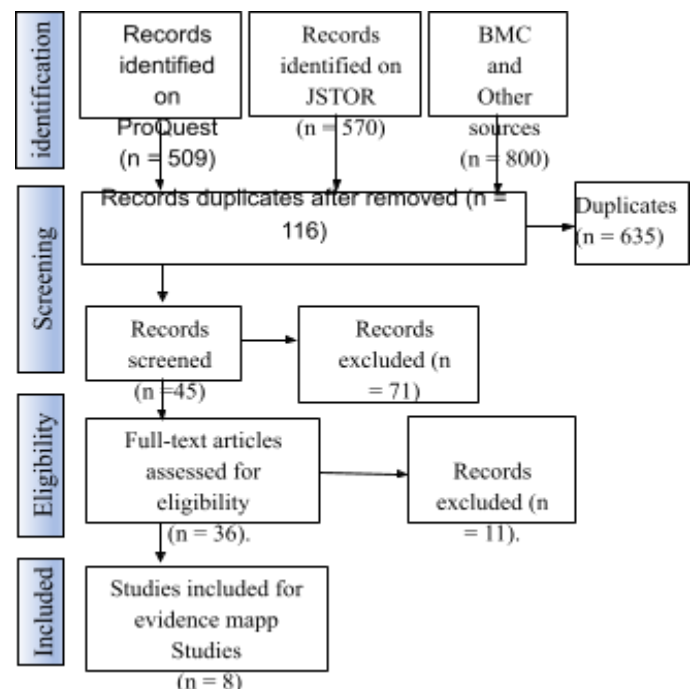
single-method perspective or investigated isolated variables, this literature review integrates personal, social, and institutional dimensions to offer a broader conceptual framework. By bridging diverse methodologies and contextual insights, this research contributes a unique model that highlights how individual factors such as resilience and self-efficacy interact with collective, organizational, and educational support to shape nurses' disaster literacy. This integrative perspective not only fills the gap in existing research but also provides a practical foundation for designing responsive nursing curricula and formulating effective disaster management policies tailored to the complex realities faced by nurses in various healthcare settings.

Although there have been several studies on disaster literacy in nurses, systematic reviews that specifically compare and synthesize determinants from various methodological perspectives are still limited. Most previous studies have focused on only one variable or used a multivariate approach. single study such as qualitative study or quantitative survey without presenting the integration of personal, institutional, and educational dimensions simultaneously. This literature review provides a new contribution by bringing together findings from qualitative, quantitative, and exploratory studies to build a holistic understanding of the factors that influence disaster literacy in nurses. The uniqueness of this study also lies in the cross-country exploration and interdisciplinary approach in dissecting the issue of disaster literacy

which is often treated partially in previous studies.

This study aims to examine in depth the factors that shape disaster literacy in nurses through a review of the latest literature. This study also aims to identify the main dimensions and conceptual models that can be used in improving disaster literacy capacity in nursing practice environments. Based on literature synthesis, the hypothesis proposed is that disaster literacy in nurses is influenced by individual factors (such as resilience and self-efficacy), social factors (collective and social support), and institutional factors (disaster education and training) (Labrague et al., 2021; Yan, 2022; Yang et al., 2024; Zhang, Zhang, Zhang, Zhang, et al., 2024a; Zhang, Zhang, Zhang, & Zhu, 2024). By identifying and analyzing these factors, this study is expected to be the basis for designing more responsive and evidence-based nursing education strategies and disaster management policies.

Methods





This study uses a systematic literature review approach to identify and analyze various factors that influence disaster literacy in nurses based on findings from a number of relevant scientific articles. This design was chosen because it is able to present a systematic and critical synthesis of knowledge, so that it can provide a deeper understanding of the actual conditions and potential interventions (Chigbu et al., 2023) in strengthening disaster literacy among nursing staff.

The literature search was conducted through several credible scientific databases, namely PubMed, ScienceDirect, and Google Scholar. The use of keywords such as "disaster literacy," "nurses," "nursing education," "disaster preparedness," and "factors influencing disaster literacy" is the main strategy in the search process. The search time limit was set from 2020 to 2025, to ensure the relevance of the analyzed data. The articles obtained were then selected by referring to the inclusion and exclusion criteria that had been previously determined.

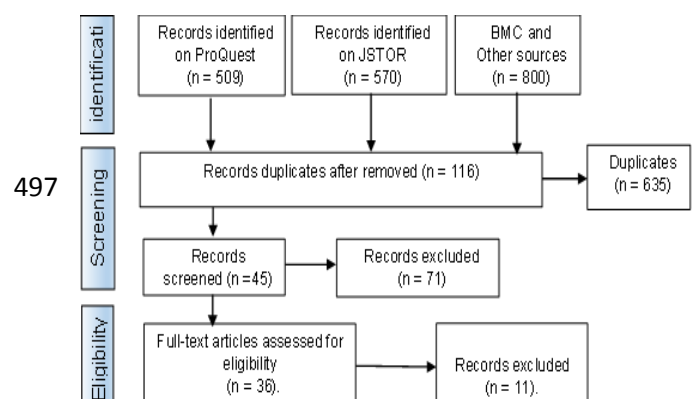
Articles that met the inclusion criteria were scientific publications that discussed disaster literacy specifically for nurses or nursing students, using qualitative, quantitative, or mixed methods research approaches, and had gone through a peer-review process. Meanwhile, articles that did not focus on nurses, were not fully accessible, or were editorials and opinions, were excluded from this study. The stages

of article selection followed the PRISMA framework consisting of the identification process, screening, eligibility checks, and finally the selection of relevant articles.

Data from selected articles were extracted into a literature review table that included the author's name, year of publication, title of the study, objectives, population and sample, and main findings related to disaster literacy factors. The analysis process was carried out thematically to identify patterns, central themes, and differences between the studies. To ensure validity and consistency, two independent researchers were involved in the selection and analysis process, and cross-validation to resolve differences in interpretation.

The initial search based on predetermined keywords identified a total of 1,879 studies, which were then screened based on inclusion and exclusion criteria. After initial screening, 1,287 studies were excluded because they were published more than six years ago, were not freely accessible full-text articles, or did not focus on disaster literacy factors in nurses. The remaining 36 studies then underwent full-text screening, with 11 articles excluded because they were not observational studies, did not focus on disaster literacy in nurses, or did not specifically analyze disaster literacy factors as the primary intervention. Thus, eight studies were selected for inclusion in this literature review.

Figure 1. PRISMA flowchart





Results

Disaster literacy in nurses is an essential competency that includes understanding, preparedness, and responsiveness to complex and unpredictable disaster situations (Said & Chiang, 2020). In recent years, the increasing frequency of natural and non-natural disasters has required nurses to have adequate disaster literacy capacity. This literacy not only involves technical knowledge about disaster management, but also includes emotional, social, ethical, and leadership in emergency contexts (Lillywhite & Wolbring, 2022). Therefore, it is important to understand the factors that shape and influence the level of disaster literacy in nurses as a basis for developing nursing education and policies.

Various studies have been conducted to uncover aspects of disaster literacy in the context of nursing, both at the student and professional nurse levels. However, the existing findings are scattered in various approaches and local contexts, so a systematic effort is needed to bring together these insights. By conducting a literature review of recent studies, we can build a more complete conceptual framework of the key factors that contribute to disaster literacy in

nurses, both from an individual and institutional perspective.

The results of this review are expected to provide a comprehensive picture of the relevant dimensions and variables, such as social support, psychological resilience, self-efficacy, educational experiences, and perceptions of responsibility in disaster preparedness. In addition, this study also considers the role of culture, training systems, and leadership in shaping strong and sustainable disaster literacy.

To support this presentation, the following is a table of literature review results that summarizes the five main articles that have been analyzed in this study. This table contains information about the authors, year of publication, title of the study, study objectives, sample and population characteristics, and key findings related to disaster literacy factors in nurses.

Table 1. Results of literature review

Author	Title	Objective	Sample & Population	Summary Discussion Related to Disaster Literacy
(MIUR A et al., 2020)	Practices and challenges of disaster nursing for Japanese nurses sent to Nepal following the 2015 earthquake	Describing disaster nursing practices and challenges by Japanese nurses in Nepal	12 Japanese nurses (average age 38.6 years) sent to Nepal after the 2015 earthquake	Disaster literacy challenges include lack of information about local diseases, social systems, and cultural backgrounds; communication difficulties; and limited adaptation of medical



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				equipment. The importance of pre-deployment training on the local context is emphasized	(Açık & Yeşilyurt Sevim, 2025)	The experiences of Nurses as First Responders to Disaster: A Qualitative Study	Exploring the experience of nurses as first responders in disaster areas	22 nurses in earthquake-affected areas in Türkiye	Nurses experience practical and psychosocial challenges, including lack of skills and knowledge in triage, crisis management, and communication. Disaster preparedness training is recommended from the beginning of professional education
(Eskici et al., 2025)	Empowering future nurses: a comparative study of nursing students in Turkey and Iran	Evaluating disaster literacy and disaster response self-efficacy of nursing students in Turkey and Iran	508 3rd and final year nursing students in Turkey (288) and Iran (220)	Disaster literacy significantly affects disaster response self-efficacy. Turkish students have higher literacy levels than Iranians. Integration of disaster preparedness curriculum into nursing education is recommended.	(Choi et al., 2022)	Perceived Disaster Preparedness and Willingness to Respond among Emergency Nurses in South Korea	Assessing disaster preparedness and emergency nurse response readiness	158 emergency nurses in South Korea	Personal/professional experience in disasters, membership in a disaster medical team, and training in the past year increase perceptions of preparedness and readiness to respond. Disaster literacy needs to be strengthened through ongoing training and incentive programs.
(AlOtaibi et al., 2024)	Enhancing Nurses' Disaster Management and Preparedness: Evaluating the Effectiveness of an Online Educational Program	Evaluating the effectiveness of an online education program on disaster preparedness and management in nurses.	88 public hospital nurses (quasi-experimental design)	The education program showed a small increase in perceptions of preparedness. It was not statistically significant, but it underscores the importance of ongoing training and the development of digital-based disaster literacy modules.	(Seong et al., 2023)	A study on the types of disaster	Identifying the types of nursing students' perceptions about	30 nursing students in South Korea	Four types of disaster awareness were found: national



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r awaren ess in nursin g student s: Q metho dology	disaster safety and analyzing the characterist ics of each type.	(aged 20s)	responsibili ty, individual responsibili ty, preparedne ss orientation, and education orientation. Disaster literacy is formed from the interaction of individual perceptions of the role of the state, personal preparedne ss, and the importance of disaster education in the curriculum.						literacy strategies nationally.	
				(Zhang, Zhang, Zhang, & Zhu, 2024)	Impro ve disaste r literac y in nurses: a qualita tive descrip tive study	Exploring disaster literacy improveme nt strategies from the perspective of nurses who have been involved in disaster manageme nt.	30 rescue nurses from 30 third-rate hospitals in China	Six focuses for disaster literacy enhanceme nt: education & training, simulation & drill (VR, military), psychosoci al support, nursing manager leadership, preparedne ss, and knowledge transformat ion. The study emphasized the importance of a multidimen sional approach to nursing education.		
(Zhang, et al., 2024b)	Disast er literac y in disaste r emerg ency respon se: a nation al qualita tive study among nurses	Exploring the main components and characterist ics of disaster literacy in nurses.	1 rescue nurses from 31 medical institutio ns in 25 provinces in China	Disaster literacy includes 9 dimensions : physical & mental quality, basic knowledge, technical competence , professiona l ethics, teamwork, emotional ability, information literacy, leadership, and knowledge transformat ion. This study emphasizes the importance of measuring and improving nursing						

The following are the results of the thematic analysis of the table above.

Educational and Curriculum Factors

Several studies have shown that formal education and integration of disaster curriculum greatly affect the level of disaster literacy in nurses and nursing students. A study by Gülcan Taşkıran Eskici (2025) highlighted that nursing students who received formal disaster preparedness education showed higher literacy levels and better confidence in responding to disasters. This is supported by research by Mihyeon Seong (2023), who found that students' perceptions of the importance of disaster education helped shape their literacy types. In addition,

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technology-based training such as online education programs studied by Sarah Saad AlOtaibi (2024) also contributed to shaping the perception of preparedness although the increase was not statistically significant.

Practical and Professional Experience

Direct experience in disaster management is a very important factor in improving disaster literacy. Research by Won-Seok Choi (2022) showed that nurses' involvement in disaster medical teams and previous experience contributed significantly to their readiness to respond to disasters. Similarly, studies by Cafer Aık (2025) and Shiori Miura (2020) noted that field experience revealed practical challenges that demonstrated the importance of technical and emotional preparedness in emergency contexts.

Psychosocial and Leadership Dimensions

Several studies also highlight that mental preparedness, emotional abilities, and psychosocial support play an important role in shaping disaster literacy. In Zhang (2024) in his two studies showed that disaster literacy does not only include technical knowledge, but also aspects of leadership, emotional regulation skills, and teamwork. Leadership from nursing managers and support systems are also mentioned as important factors in strengthening literacy, especially in the context of simulations, drills, and psychosocial-based interventions.

The Role of Social and Cultural Context

Disaster literacy is also greatly influenced by the understanding of the social and cultural context in which nurses work. Shiori Miura (2020) showed how limited information about local culture and social systems in Nepal posed a major challenge for Japanese nurses assigned there. This confirms that disaster literacy is contextual and requires strong cross-cultural adaptation and understanding.

Knowledge Reinforcement and Transformation Strategy

Finally, several studies emphasize the importance of transforming knowledge from experience into educational practices and policies. Di Zhang's study (2024) highlights the importance of developing multidimensional strategies such as intensive training, the use of simulation technology (e.g. VR), psychosocial reinforcement, and the involvement of nursing managers in the literacy enhancement process. Disaster literacy is not only built through experience, but also needs to be supported by a learning system that continues to develop and is contextual.

Discussion

The results of the thematic analysis of eight studies indicate that disaster literacy in nurses is a complex competency that not only includes theoretical knowledge, but also concerns psychological readiness, technical skills, and the ability to adapt to dynamic and multicultural situations. In the context of nursing, disaster literacy is not sufficiently understood as an understanding of protocol or SOP when a disaster occurs, but rather as a set of skills that enable nurses to effectively respond,



lead, and provide services in stressful situations. This shows that disaster literacy is multidimensional and needs to be developed through a comprehensive approach, which includes aspects of education, experience, personalized learning, and system support.

One of the most dominant factors contributing to increasing disaster literacy is structured and integrative formal education. Studies by Gülcan Taşkıran Eskici (2025) and Mihyeon Seong (2023) showed that nursing students who received disaster material systematically had a higher level of preparedness, both cognitively and affectively. Eskici emphasized that the nursing curriculum should not only emphasize medical knowledge, but also include disaster scenarios, emergency management, and crisis communication training. Seong even identified that students' perceptions of roles and responsibilities in a disaster context are largely determined by their exposure to disaster literacy topics during their education. Therefore, it is important for educational institutions to design a curriculum that is able to instill awareness of preparedness from an early age, accompanied by participatory teaching methods such as simulations, case studies, and virtual reality (VR) technology.

In addition to education, direct experience in disaster situations has been shown to be a catalyst in the formation of more mature and applicable disaster literacy. Studies by Won-Seok Choi (2022), Cafer Açıık (2025), and Shiori Miura (2020) consistently show that nurses who have been involved in disaster management show higher preparedness

and confidence. Field experience not only strengthens technical skills such as triage and mass casualty management, but also train emotional resilience, quick decision-making skills, and high-pressure communication skills. In this case, experiential learning becomes a strategic approach in disaster literacy training, where field experience or involvement in emergency response teams becomes an irreplaceable source of learning. Health care institutions should open more space for nurses to participate in field training, disaster simulations, or work rotations in disaster-prone areas to strengthen their functional readiness.

Furthermore, disaster literacy in nurses is also determined by systemic support and strong organizational leadership. Zhang (2024) emphasized that disaster literacy cannot develop optimally without support from nursing management, including in terms of providing ongoing training, providing incentives, and strengthening team capacity through cross-sector coordination. The multidimensional approach as mentioned in Zhang's two studies shows that education alone is not enough. Strengthening of psychosocial aspects (through mental and emotional support), integration of technology (simulation and VR), and the formation of a work culture that is responsive to disasters are needed. The leadership of nursing managers is crucial in this regard, because they act as learning facilitators, motivators in the team, and liaisons between institutional policies and practices in the field. In other words, the success of improving disaster literacy is highly dependent on the synergy



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between individual nurses and the institutional structures in which they work.

Finally, contextual dimensions such as cultural factors, language, and social systems also influence the ability of nurses to understand and respond appropriately to disasters. Miura's study (2020) involving Japanese nurses assigned to Nepal after the 2015 earthquake showed that the biggest challenge was not in technical skills, but in the gap in understanding local culture and health care systems. Nurses faced language barriers, difficulties understanding local diseases, and limitations adaptation to medical devices and community customs. This shows that disaster literacy is situational and contextual, so that cross-cultural pre-assignment training is very important, especially in international assignments or assignments in areas with different socio-cultural characteristics. Disaster literacy should not be static and universal, but must be flexible and contextual according to the location and type of disaster faced.

By considering all these findings, it can be concluded that disaster literacy in nurses is not a single entity that can be formed through one educational strategy alone. Instead, this literacy is the result of the interaction between experience, education, personal perception, and a supportive work environment. Therefore, the development of disaster literacy needs to be carried out through an integrated approach involving formal education, ongoing training, field experience, and support from institutional leadership. Disaster literacy must be an important part of national nursing capacity building, not only to improve individual

nurse preparedness, but also to strengthen the health service system in facing disasters collectively.

Conclusion

From the results of the literature analysis on disaster literacy factors in nurses, it can be concluded that disaster literacy has a very vital role in increasing the capacity of nurses in dealing with disasters. Nurses need to have technical knowledge, good communication skills, and mental and emotional preparedness to be able to respond to disaster situations effectively. Various factors, such as formal education that includes a disaster preparedness curriculum, direct experience in disaster management, and systemic support from health organizations, greatly contribute to building this competency. In addition, simulation-based training and increased leadership skills in hospital settings have also been shown to be effective in improving disaster literacy. Thus, disaster literacy in nurses should be a primary focus in efforts to improve the quality of health care during times of crisis.

Future research can further explore the impact of various disaster literacy training methods, especially with technology-based approaches such as virtual reality (VR) simulations, which can provide practical experience without the need for a real disaster situation. In addition, it is important to examine the influence of organizational support and leadership policies in strengthening disaster literacy among nurses. This research will be very useful for designing more effective training and education



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strategies and developing curriculum models that can be applied globally. The influence of social and cultural factors in each country also needs to be further studied to adapt training approaches to local contexts. Thus, developing disaster literacy based on local contexts and supportive systems will help create a more coordinated and effective response to disaster management.

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