

REVIEW

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# Overcoming challenges in nursing disaster preparedness and response: an umbrella review

Abdullellah Al Thobaity<sup>1\*</sup>

## Abstract

Disaster nursing plays a vital role in addressing the health needs of vulnerable populations affected by large scale emergencies. However, disaster nursing faces numerous challenges, including preparedness, logistics, education, ethics, recovery and legalities. To enhance healthcare system effectiveness during crises, it is essential to overcome these issues. This umbrella review, conducted using the Joanna Briggs Institute (JBI) methodology, synthesizes data from 24 studies to identify key strategies for improving disaster nursing. The review highlights nine key themes: Education and Training, Research and Development, Policy and Organizational Support, Technological Advancements, Psychological Preparedness and Support, Assessment and Evaluation, Role-Specific Preparedness, Interprofessional Collaboration and Cultural Competence, and Ethics and Decision-Making. The review emphasizes the importance of education, technological advancements, psychological support, and interprofessional collaboration in bolstering disaster nursing preparedness and response efforts. These elements are crucial for enhancing patient outcomes during emergencies and contributing to a more resilient healthcare system. This comprehensive analysis provides valuable insights into the various aspects essential for enhancing disaster nursing. By implementing evidence-based strategies within these nine themes, the nursing profession can enhance its capacity to effectively manage and respond to the complex needs of disaster-affected populations, ultimately improving patient care and outcomes during emergencies.

**Keywords** Keyword disaster nursing, Preparedness strategies, Healthcare system resilience, Interprofessional collaboration, Emergency response education

## Introduction

Disaster nursing is a specialized field that focuses on the provision of care and support individuals and communities who are affected by emergencies and crises. Disaster Nursing, emphasizes the critical roles of nurses in addressing the health needs of vulnerable populations

who has special needs such as elderly and children during disasters [1]. Competent disaster Nursing is essential to improve the overall effectiveness and efficiency of healthcare systems during times of crisis by ensuring the well-being and resilience of individuals and communities. However, disaster nursing faces major challenges that must be acknowledged and addressed, including preparedness and planning, logistical, and organizational, as well as education, training, recovery and ethical and legal considerations [2, 3]. By exploring these challenges and identifying strategies for overcoming them, nursing profession can continue to evolve and enhance the ability

\*Correspondence:

Abdullellah Al Thobaity  
abdullellah.althobaity@hotmail.com

<sup>1</sup>Medical Surgical Nursing, College of Nursing, Taif University, P. O. Box 11099, Taif 21944, Saudi Arabia



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to respond to the complex needs of those affected by disasters.

Challenges related to preparedness and planning in disaster nursing encompass various aspects that can hinder effective crisis response in many countries worldwide [1, 4, 5]. These include limitations in the disaster paradigm, inadequacies in the pre-hospital system, lack of coordination and cooperation among stakeholders, insufficient hospital preparedness, scarce resources and capacities, and gaps in patient knowledge [6, 7]. Furthermore, challenges in planning for the unpredictable nature of disasters, disparities in emergency nurses' preparedness, workplace readiness, and the preparedness of colleagues and institutions (including leadership and peers) contribute to the complexity of the issue [8]. Limited availability of training opportunities, individual preparedness due to lack of prior experience, absence of a comprehensive disaster plan, insufficient disaster training, and unassigned roles in workplace disaster plans further exacerbate the difficulties faced by nursing professionals in the realm of disaster preparedness and planning [8–11]. Addressing these challenges is crucial for enhancing the ability of nurses and healthcare institutions to effectively manage and respond to emergencies.

Logistical, organizational, and managerial challenges pose significant obstacles to effective disaster nursing in numerous countries worldwide. Such as Japan ; China and Iran [2, 12, 13] Logistical challenges, such as constructing and operating hospitals in disaster zones and addressing equipment issues, create difficulties in the provision of care [2]. Staff challenges, including the orientation of personnel in new and challenging environments, further complicate the situation [14]. Organizational and managerial challenges encompass the development and implementation of appropriate policies, procedures, and support structures, which are essential for enabling nursing professionals to work effectively under extreme conditions [2]. Adequate support from hospital administration, the promotion of evidence-based practice research, and the use of evaluation tools to assess and improve performance are crucial in overcoming these challenges. Gaps in these areas can hinder the ability of nurses and health care institutions to manage and respond effectively to emergencies, underscoring the need for comprehensive strategies to address logistical, organizational, and managerial challenges in disaster nursing.

Challenges related to education and training in disaster nursing have far-reaching consequences on the ability of nurses to effectively respond to emergencies [15]. These challenges encompass the defining roles of nurses, the creation and implementation of educational training programs, and the overall education system. Factors such as the lack of disaster educators, insufficient formal

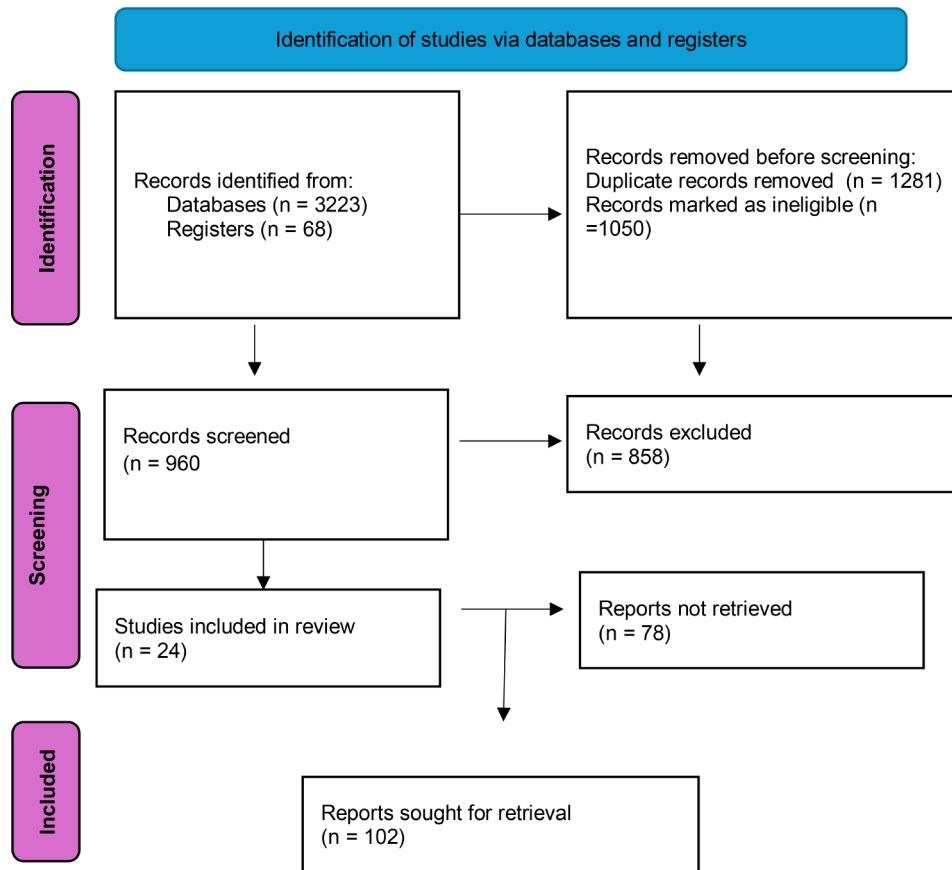
education, inadequate nurse training, and limited disaster experience hinder the development of competent and prepared nursing professionals [2]. Furthermore, challenges in understanding hospital disaster policies and procedures, and the roles of nurses in disaster management, as well as deficiencies in communication and leadership skills, contribute to the problem. Personal evacuation experiences, a scarcity of studies, the lack of specialized journals, inaccessible programs, and gaps in nursing curricula further exacerbate the difficulties faced by nursing professionals. Addressing these educational and training challenges is essential to equip nurses with the knowledge, skills, and confidence required to effectively manage and respond to disasters.

Ethical and legal challenges in disaster nursing present unique obstacles that nursing professionals must navigate while providing care in crisis situations [16]. These challenges include addressing patient-related issues, such as cultural differences, language barriers, and follow-up concerns [17, 18]. Ethical challenges unique to disaster zones and related to the scope and scale of the disaster, along with more general ethical issues, arise in areas such as justice in resource allocation, privacy and confidentiality, beneficence and non-maleficence. Furthermore, determining appropriate triage, setting treatment priorities, working autonomously, and obtaining informed consent can be particularly complex in disaster settings [3, 18]. Conflicts and legal issues such as allocating the resources may also emerge, further complicating the delivery of care during emergencies. Addressing these ethical and legal challenges is vital for ensuring that nursing professionals can provide compassionate and effective care while upholding their professional responsibilities and the rights of the patients they serve.

Conducting an umbrella review on overcoming the challenges faced by disaster nursing is crucial for various reasons. First, it allows for a comprehensive and systematic synthesis of evidence from multiple systematic reviews, identifying studies, evidence, and interventions employed to address these challenges, thus mapping the knowledge landscape and progress made. Secondly, it reveals gaps in the literature, highlighting areas for further research and guiding researchers in prioritizing underexplored topics. Thirdly, it offers valuable insights into effective strategies and best practices, informing policymakers, healthcare institutions, and nursing professionals about evidence-based interventions and policies. Additionally, an umbrella review can facilitate interdisciplinary collaboration by revealing shared challenges and solutions across various fields, foster innovation and the development of integrated approaches to disaster nursing, and ultimately enhancing the efficacy and resilience of healthcare systems in responding to emergencies. Hence, the aim of this umbrella review is to explore the

**Table 1** Eligibility criteria for included studies

Eligibility criteria	Description
Study design	Include primary research studies (qualitative, quantitative, and mixed-methods), systematic reviews, and other scoping reviews.
Population	Nurses and other healthcare professionals involved in disaster preparedness and response.
Intervention	Strategies or interventions aimed at overcoming nursing challenges in disaster situations.
Outcomes	Measures of effectiveness or success of the identified strategies or interventions
Language	English language articles.



**Fig. 1** PRISMA flowchart of study selection process

strategies that have been implemented in overcoming nursing challenges in disaster preparedness and response.

**Methods**

This umbrella review was conducted following the Joanna Briggs Institute (JBI) methodology for umbrella reviews. The purpose of this review is to synthesize existing systematic reviews related to the challenges in nursing disaster preparedness and response [19]. Studies were selected for inclusion in this research based on the criteria outlined in Table 1.

A comprehensive search strategy was developed using relevant keywords and Medical Subject Headings (MeSH) terms, including “nursing,” “disaster preparedness,” “disaster response,” “challenges,” “interventions,” “strategies,” and “effectiveness,” applied to selected

databases (PubMed, CINAHL, Scopus, Web of Science, and PsycINFO) and grey literature sources. Handsearching reference lists of included articles further enhanced the search. Duplicates were removed using EndNote reference management software, and titles and abstracts were screened based on eligibility criteria. Potentially eligible full-text articles were assessed for inclusion, and the study selection process was documented using a PRISMA flowchart Fig. 1. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram outlines the study selection process for this review.

**Result**

Initially, 3,223 records were identified from databases and 68 from registers. Before screening, 1,281 duplicate records and 1,050 ineligible records were removed,

leaving 960 records for screening. After excluding 858 records, 102 reports were sought for retrieval, resulting in a final inclusion of 24 studies in the review which involve the following : *Al Thobaity, Plummer, & Williams, 2017* [20] ; *Kalanlar, 2019* [21] ; *Zarea et al., 2014* [2]; *Jose & Dufrene, 2014* [22]; *Cong Geng, Yiqing Luo, Xianbo Pei, & Xiaoli Chen, 2021* [23]; *Alice Yuen Loke, Chunlan Guo, & Alex Molassiotis, 2021* [5] *Nejadshafiee, Bahaadinbeigy, Kazemi, & Nekoei-Moghadam, 2020* [24]; *Karin Hugelius & Adolffson, 2019* [25]; *Veenema, Lavin, Bender, Thornton, & Schneider-Firestone, 2019* [26]; *Labrague et al., 2018* [27] *Yousefi, Larijani, Golitaleb, & Sahebi, 2019* [28] ; *Varghese et al., 2021* [29]; *Kalanlar, 2022* [30] ; *Said & Chiang, 2020* [31]; *Pourvakhshoori, Norouzi, Ahmadi, Hosseini, & Khankeh, 2017* [32]; *Hutton, Veenema, & Gebbie, 2016* [33]; *Su et al., 2022* [34]; *Firouzkouhi, Kako, Abdollahimohammad, Balouchi, & Farzi, 2021* [35]; *Tas & Cakir, 2022* [36]; *Lin, Tao, Feng, Gao, & Mashino, 2022* [37]; *Fithriyyah, Alda, & Haryani, 2023* [38]; *Songwathana & Timalisina, 2021* [39] and *Kimin, Nurachmah, Lestari, & Gayatri, 2022* [40] *Putra, Kamil, Yuswardi, & Satria, 2022* [41]. The essential information such as: authors, publication year, type of review and key strategies were extracted and summarised in Table 2.

#### Data synthesis

In this umbrella review, a single investigator conducted the thematic analysis using a thorough and systematic approach. The process began with familiarization through detailed reading and note-taking, followed by manual coding to identify key concepts. Preliminary themes were developed by grouping similar codes and refined iteratively for coherence. To enhance credibility, feedback was sought from a senior qualitative researcher. Detailed documentation of the process ensured transparency, while reflexive notes and discussions with the senior researcher mitigated potential bias. This approach ensured rigorous and transparent theme identification, enhancing the findings' reliability and validity. Data from selected studies were synthesized to create a narrative synthesis, organized by strategies for improving disaster nursing. These strategies were summarized into nine key themes: (1) Education and Training; (2) Research and Development; (3) Policy and Organizational Support; (4) Technological Advancements; (5) Psychological Preparedness and Support; (6) Assessment and Evaluation; (7) Role-Specific Preparedness; (8) Interprofessional Collaboration and Cultural Competence; and (9) Ethics and Decision-Making. This approach allowed for a comprehensive analysis of the various aspects of disaster nursing enhancement.

#### Discussion

This umbrella review aims to explore and emphasize the diverse strategies implemented to address nursing challenges in disaster preparedness and response. By synthesizing findings from the included studies, the discussion is organized into the nine key themes previously mentioned. Through a narrative synthesis of these themes, the review provides a comprehensive understanding of the various approaches used to enhance disaster nursing. Examining these strategies is intended to inform future research, policy, and practice, ultimately leading to improved disaster preparedness and response, better patient care, and enhanced outcomes during emergencies.

#### Education and training

Improving disaster nursing locally and worldwide requires a multifaceted approach, starting with enhancing nurses' understanding of core competency domains [10]. Integrating these domains into training and disaster drills helps reinforce practical skills, ensuring efficient and effective responses in real-life disaster situations [10, 22]. Expanding undergraduate and graduate disaster nursing education on national and international levels creates a well-prepared workforce capable of addressing diverse challenges in disaster management [21–23]. Effective training programs can address existing gaps in education by providing ongoing professional development opportunities for nurses. Establishing dedicated organizational units within healthcare systems to prepare for and respond to disasters by educating healthcare providers, including nurses, enhances disaster preparedness by encouraging collaboration and resource sharing. Moreover, a focused approach to improving education and training in disaster nursing is crucial worldwide [5, 21, 23, 42]. Developing educational content for disaster nursing requires a tailored approach that considers the unique needs and challenges of the field. This includes accounting for various types of disasters, impacted healthcare settings, and the diverse roles that nurses play in disaster situations. By addressing these distinct aspects, educational materials can better equip nurses with the skills and knowledge needed to respond to emergencies and deliver high-quality patient care in disaster preparedness and response contexts [3, 42]. Lastly, incorporating interprofessional education promotes teamwork, communication, and coordination among different healthcare providers, ultimately contributing to enhanced disaster preparedness worldwide [43].

#### Research and development in disaster nursing

Research and development (R&D) are critical for advancing disaster nursing. They generate evidence-based knowledge that guides clinical practice [5, 44]. By

**Table 2** Summary of extracted data from included studies

Authors	Aim	Type of review	Strategies for improvement
<i>Al Thobaity, Plummer, &amp; Williams, 2017</i> [1]	Identify the most common domains of the core competencies of disaster nursing through a scoping review.	Scoping review using Joanna Briggs Institute methodology	<ul style="list-style-type: none"> <li>• Improve nurses' understanding of core competency domains.</li> <li>• Incorporate disaster nursing domains into nurse training and disaster drills.</li> <li>• Involve nurses in research activities related to disaster management</li> </ul>
<i>Kalanlar, 2019</i> [2]	Assess the challenges and opportunities in disaster nursing education in Turkey	An integrative narrative analysis of studies	<ul style="list-style-type: none"> <li>• Provide undergraduate and graduate disaster nursing education at national and international levels.</li> <li>• Offer training programs for employed nurses to improve their education, practice, and research skills.</li> </ul>
<i>Zarea et al., 2014</i> [3]	Examine nurses' unique role in the management of disasters in Iran	An integrative narrative analysis	<ul style="list-style-type: none"> <li>• Establish units to train employees</li> <li>• Connect nursing staff with disaster organizations</li> <li>• Make useful educational materials</li> <li>• Create affordable systems for disaster readiness and response</li> <li>• Conduct more rigorous research.</li> <li>• Incorporate interprofessional education for disaster preparedness</li> </ul>
<i>Jose &amp; Dufrene, 2014</i> [4]	Identify suitable disaster preparedness competencies for undergraduate nursing curriculum. And determine suitable instruction methods for disaster preparedness content.	Literature review	<ul style="list-style-type: none"> <li>• Conduct high-level research on the application of simulation in disaster care.</li> </ul>
<i>Cong Geng, Yiqing Luo, Xianbo Pei, &amp; Xiaoli Chen, 2021</i> [5]	Systematically map the extent and application of simulation in disaster nursing education.	Scoping review using the model of Arksey and O'Malley	<ul style="list-style-type: none"> <li>• Tackle the unequal geographical distribution of disaster nursing education and training.</li> <li>• Include all stages of disaster management: prevention, readiness, response, and recovery in nursing education programs.</li> <li>• Persistently investigate and adopt a variety of tactics and technologies for effective disaster nursing education.</li> <li>• Implement tele nursing to address the shortage of specialized nurses in disaster areas.</li> <li>• Utilize technology to enhance health care response during disasters.</li> </ul>
<i>Alice Yuen Loke, Chunlan Guo, &amp; Alex Mollasiotis, 2021</i> [6]	Analyze development, content, approaches, and outcomes of disaster nursing education and training in the last 20 years.	Systematic review	<ul style="list-style-type: none"> <li>• Apply the HOPE model to guide disaster nursing</li> <li>• Conduct further research on disaster nursing across all phases, including preparation, prevention, and recovery</li> <li>• Develop specialist methods for research in disaster nursing</li> <li>• Study practical approaches for providing psychosocial support, holistic health assessments, disaster nurse management, and minimizing unwell-being for deployed nurses.</li> <li>• Identify specific roles and responsibilities of nurses in radiation emergencies and nuclear response.</li> <li>• Ascertain quantitative measurement of the level of national nurse readiness for large-scale radiation emergency and nuclear events.</li> <li>• Conduct research on training and preparedness to enhance nurse readiness for radiation emergencies and nuclear events.</li> </ul>
<i>Nejadshafiee, Bahadabinbeigy, Kazemi, &amp; Nekoei-Moghadam, 2020</i> [7]	Analyze development, content, approaches, and outcomes of disaster nursing education and training in the last 20 years.	Systematic review	<ul style="list-style-type: none"> <li>• Enhance preparedness for disaster response through disaster-related training and learning from previous disaster response experiences.</li> <li>• Implement policies in hospitals to address the lack of preparedness among employees.</li> <li>• Conduct further research and provide well-grounded disaster exercises that mimic actual events to enhance the preparedness of the nursing workforce.</li> </ul>
<i>Karin Hugelius &amp; Adolfsson, 2019</i> [8]	Develop a model for disaster nursing through a systematic review of real-life experiences during the response phase.	Systematic review	
<i>Veemema, Lavín, Bender, Thornton, &amp; Schneider-Fires-tone, 2019</i> [9]	Conduct a systematic review of the literature to assess nurse readiness for radiation emergencies and nuclear events	Systematic review	
<i>Labrage et al., 2018</i> [10]	Explore peer-reviewed publications that measure nurses' preparedness for disaster response.	Systematic review	

**Table 2** (continued)

Authors	Aim	Type of review	Strategies for improvement
Yousefi, Larjani, Gollitaleb, & Sahebi, 2019 [11]	Assess the knowledge, attitude, and performance concerning disaster preparedness in Iranian nurses.	Systematic review and meta-analysis	<ul style="list-style-type: none"> <li>Enhance the knowledge and performance of Iranian nurses in disaster preparedness through targeted training.</li> <li>Conduct hospital drills to improve preparedness and practical skills for coping with disasters.</li> <li>Maintain and strengthen the positive attitudes of Iranian nurses towards disaster preparedness.</li> </ul>
Varghese et al., 2021 [12]	Explore the prevalence and determinants of mental health outcomes (anxiety, stress, depression, PTSD, insomnia) among nurses across the globe due to the COVID-19 pandemic.	PRISMA compliant systematic review	<ul style="list-style-type: none"> <li>Implement proactive psychological interventions to support nurses experiencing poor mental health outcomes during the pandemic.</li> <li>Provide flexible support to nurses through healthcare organizations.</li> <li>Include provisions to address the mental health of nurses in disaster preparedness plans.</li> <li>Invest in addressing the global nurse shortage and prioritize nursing within national health policies.</li> <li>Offer attractive salary packages to nurses to prevent emigration from low- and middle-income countries (LMICs).</li> </ul>
Kalanlar, 2022 [13]	Assess the psychometric properties of scales developed or adapted to evaluate the sudden-impact natural disaster preparedness of nurses.	Systematic literature review	<ul style="list-style-type: none"> <li>Expand the content scope of existing scales to better assess nurses' disaster preparedness.</li> <li>Develop new scales for a comprehensive assessment of nurses' disaster preparedness.</li> </ul>
Said & Chiang, 2020 [14]	Evaluate nursing preparedness for disasters in terms of knowledge, skill competencies, and psychological preparedness.	Systematic review	<ul style="list-style-type: none"> <li>Improve nurses' psychological preparedness, knowledge, and skills for better care during disasters.</li> <li>Prioritize nurse education for enhanced psychological disaster preparedness.</li> <li>Create and apply targeted training for nurse disaster response competency.</li> </ul>
Pourvakhshoori, Norouzi, Ah-madi, Hosseini, & Khankeh, 2017 [15]	Examine research conducted using disaster nursing and the models adopted, providing a critical analysis of the models available for disaster nursing.	Integrative review	<ul style="list-style-type: none"> <li>Advance the development of disaster nursing models to inform disaster risk reduction strategies.</li> <li>Conduct further research to create an affective nursing model for disaster response situations.</li> </ul>
Hutton, Veenema, & Gebbie, 2016 [16]	Review the use of the ICN Framework of Disaster Nursing Competencies and identify areas for improvement.	Scoping review	<ul style="list-style-type: none"> <li>Add psychosocial elements to competencies for self-care and colleague support.</li> <li>Investigate missing or underdeveloped areas in disaster nursing practice.</li> </ul>
Su et al., 2022 [17]	Map the nursing skills required for different types of disasters	Scoping review	<ul style="list-style-type: none"> <li>Study ICN Framework's impact on best practices and disaster victim outcomes.</li> <li>Apply identified skills in future disaster nursing education.</li> <li>Develop accurate scenario-based simulation training.</li> <li>Continuously improve training for diverse disaster situations.</li> </ul>
Firouzkouhi, Kako, Abdollahimohammadi, Balouchi, & Farzi, 2021 [18]	Explore nurses' role in the nursing disaster model	A scoping review using the Joanna Briggs Institute framework	<ul style="list-style-type: none"> <li>Understand nurses' roles in crises comprehensively.</li> <li>Ready nurses for effective care in crisis stages.</li> <li>Evaluate and update disaster models to improve nurse effectiveness.</li> </ul>
Tas & Cakir, 2022 [19]	Investigate the results of peer-reviewed publications measuring nurses' level of knowledge and preparedness for disasters	Systematic review	<ul style="list-style-type: none"> <li>Enhance education and training for disaster preparedness.</li> <li>Highlight previous experience and disaster education.</li> <li>Regularly assess and update training for effective disaster response.</li> </ul>
Lin, Tao, Feng, Gao, & Mashino, 2022 [20]	Explore components of cultural competence in disaster nursing and propose a disaster nursing cultural competence framework	Scoping review	<ul style="list-style-type: none"> <li>Integrate cultural competence into disaster relief planning and public health research.</li> <li>Address the complexities of the disaster context in cultural competence frameworks.</li> <li>Educate and train nurses in cultural competence, focusing on cultural desire, awareness, knowledge, skills, and encounters.</li> </ul>
Fithriyyah, Alida, & Haryani, 2023 [21]	Identify trends and ethical issues of nurses in disasters to improve the quality of care and impact for nurses.	Systematic review	<ul style="list-style-type: none"> <li>Understand the potential ethical dilemmas nurses face in disaster situations.</li> <li>Identify factors that support ethical decision-making for nurses in disasters.</li> <li>Develop strategies for applying ethics and dealing with ethical issues in disasters.</li> <li>Assess the impact of applying ethics in disasters and use findings to inform nursing education, institutional policies, and scenario development.</li> </ul>

**Table 2** (continued)

Authors	Aim	Type of review	Strategies for improvement
Songwathana & Timalisina, 2021 [22]	Synthesize available evidence demonstrating the adequacy of disaster preparedness among nurses in developing countries.	An integrative review	<ul style="list-style-type: none"> <li>• Provide well-designed disaster nursing educational packages and training manuals.</li> <li>• Support nurses' attendance at disaster drills and participation in actual disaster events.</li> <li>• Enhance disaster preparedness through continuous education and training.</li> </ul>
Kimin, Nurachmah, Lestari, & Gayatri, 2022 [23]	Identify factors influencing nurses' ability to provide adequate care during disaster emergency response.	An integrative review	<ul style="list-style-type: none"> <li>• Provide training to improve nurses' knowledge and skills in disaster response.</li> <li>• Encourage clinical experience or previous disaster experience to increase nurses' adaptability.</li> <li>• Ensure support from workplaces and proper implementation of disaster management policies.</li> <li>• Educate nurses' families on disaster preparedness to enhance nurses' willingness to work following a disaster.</li> </ul>
Putra, Kamil, Yusuf, & Satria, 2022 [24]	Identify the knowledge and perceived ability to practice of public health nurses (PHNs) in the disaster emergency response phase	Systematic review	<ul style="list-style-type: none"> <li>• Enhance PHNs' knowledge and abilities in handling disaster warnings and triage.</li> <li>• Train PHNs in life-saving and stabilizing techniques during disasters.</li> <li>• Improve PHNs' skills in surveillance and risk communication during disaster response.</li> <li>• Develop technical skills necessary for PHNs to effectively manage various disaster situations.</li> </ul>

involving nurses in research focused on competencies, studies become more relevant and applicable, as they are rooted in real-world experiences [44]. It is essential to optimize resource allocation in order to be more efficient and effective for both disaster preparedness and response [5]. Rigorous research, combined with addressing limitations in study design and methods, enhances the quality of the evidence base, which then informs best practices in disaster nursing [5, 44]. One area of research with significant potential is the application of simulation in disaster care. High-level studies in this field can reveal innovative training methods, improving nurses' readiness and performance during crises [21, 23]. Additionally, exploring practical approaches in areas such as psychosocial support, holistic health assessments, disaster nurse management, and minimizing distress for deployed nurses can contribute to comprehensive and integrated strategies. These strategies ultimately promote optimal patient care and nurse well-being during disaster response efforts.

**Policy and organizational support**

Policy and organizational support are crucial in strengthening disaster nursing by fostering collaboration among nursing staff, health care organizations, and governments. Key strategies include formalizing relationships between nursing staff and disaster organizations, which is essential for seamless communication and coordination during large scale emergencies [21]. Implementing robust hospital policies that promote disaster preparedness through regular drills and training can significantly enhance the readiness of healthcare facilities [26]. Investing in comprehensive disaster nursing education programs at both national and international levels addresses global nursing shortages and ensures that nurses are adequately prepared for disaster response [24]. Offering competitive salary packages, particularly in low- and middle-income countries, can improve nurse retention rates and maintain a skilled workforce capable of effective disaster management [27]. These strategies not only improve disaster response outcomes but also enhance hospital preparedness and the overall resilience of the healthcare system.

**Technological advancements in disaster nursing**

The integration of technological advancements presents a significant opportunity to revolutionize disaster nursing, impacting education, access to specialized care, and the efficiency of healthcare response during emergencies. As highlighted in the literature, incorporating innovative educational technologies like virtual reality and e-learning platforms can significantly improve disaster nursing training [23, 34]. These technologies offer immersive and engaging learning experiences, allowing nurses to practice critical skills in simulated disaster scenarios

without real-world risks. This is particularly crucial given the need for continuous improvement in training for diverse disaster situations [34]. Furthermore, telenursing emerges as a promising solution to address the shortage of specialized nurses in disaster-stricken areas [37]. By leveraging telecommunication technologies, experienced nurses can provide remote consultations, triage, and support to frontline healthcare workers, ensuring timely and specialized care for disaster victims. Mobile health applications and electronic health records can further enhance disaster response by streamlining communication and decision-making during crises [37]. These technologies facilitate real-time data sharing, patient tracking, and resource allocation, ultimately leading to a more coordinated and effective response.

Realizing the full potential of these technological advancements requires a collaborative effort. Nursing educators must embrace and integrate these technologies into their curricula, while healthcare organizations need to invest in the necessary infrastructure and training for their staff. Researchers play a crucial role in evaluating the effectiveness of these technologies and identifying best practices for their implementation in disaster settings. By fostering collaboration and innovation, we can leverage technological advancements to enhance disaster nursing preparedness and response, ultimately improving patient outcomes and saving lives.

### **Psychological preparedness and support**

Psychological preparedness and support play a vital role in disaster nursing, contributing to the well-being and resilience of healthcare professionals and impacted communities. Implementing strategies like the HOPE model, proactive psychological interventions, flexible support, and including mental health provisions in disaster preparedness plans can effectively address nurses' emotional and psychological needs during emergencies. The HOPE model for disaster nursing is a framework emphasizing holistic health assessment, immediate response, professional adaptation, and recovery [25]. Studies have highlighted the importance of psychological preparedness, emphasizing the need for proactive psychological interventions and mental health provisions in preparedness plans due to the mental health impact of the COVID-19 pandemic on nurses [29]. It is essential to improve nurses' psychological preparedness and prioritize education to enhance their ability to respond effectively to disasters [31]. Some scholars emphasize the need for targeted training that incorporates psychological support [32, 35], while others discuss strategies to address the complexities of disaster contexts, including psychological readiness [39]. By prioritizing psychological preparedness and support, healthcare organizations and policymakers can equip nurses to better handle challenges during disasters,

ultimately resulting in enhanced patient care and a more robust healthcare system.

### **Assessment and evaluation**

Assessment and evaluation play a crucial role in disaster nursing, offering key insights into the preparedness and abilities of the nursing workforce. By broadening the scope of existing scales, creating comprehensive assessment tools, and emphasizing improvements in nurses' psychological preparedness, knowledge, and skills, healthcare organizations and educators can gain a deeper understanding of the strengths and weaknesses in current disaster nursing practices. For instance [27], systematically reviewed literature to gauge nurses' preparedness for disaster response, identifying gaps and areas for improvement. Similarly [28], conducted a systematic review and meta-analysis to assess the knowledge, attitudes, and performance of Iranian nurses regarding disaster preparedness, highlighting key areas needing enhancement. Furthermore [29], explored the mental health outcomes of nurses globally during the COVID-19 pandemic, underscoring the importance of psychological preparedness. Additionally [26], assessed nurse readiness for radiation emergencies and nuclear events, providing critical insights into preparedness gaps and specific roles and responsibilities. These studies collectively underscore the necessity for rigorous assessment and evaluation frameworks in disaster nursing, enabling the implementation of targeted interventions to boost nurses' capacity to deliver effective care during disasters, thereby fostering a more resilient and responsive healthcare system.

### **Role-specific preparedness**

Role-specific preparedness is vital in disaster nursing, ensuring that nurses possess the required knowledge and skills to effectively manage diverse emergencies, such as radiation and nuclear events [20]. underscore the importance of identifying core competency domains through a scoping review to enhance disaster nursing. Similarly, [21] highlights the challenges and opportunities within disaster nursing education in Turkey, emphasizing the need for integrative training approaches [2]. Focus on the unique roles of nurses in disaster management in Iran, advocating for role-specific training tailored to regional needs [22]. Argue for incorporating disaster preparedness competencies into the undergraduate nursing curriculum, suggesting that suitable instruction methods are crucial for effective education. Moreover [23], map the application of simulation in disaster nursing education, demonstrating that simulation-based training can significantly enhance nurses' preparedness for handling radiation and nuclear emergencies. By incorporating these findings into educational and training programs, healthcare organizations and policymakers can better



equip nurses to deliver specialized care during such critical events, leading to a more efficient and coordinated healthcare response.

#### **Interprofessional collaboration and cultural competence**

Interprofessional collaboration and cultural competence are crucial for effective disaster nursing, fostering a comprehensive and inclusive approach to emergency response. Interprofessional collaboration involves coordinated efforts among different healthcare professions, enhancing communication, reducing redundancies, and ensuring a more efficient and cohesive response to emergencies. By integrating cultural competence into disaster relief planning and public health research, and by educating and training nurses in both interprofessional collaboration and cultural competence, healthcare professionals' ability to work cooperatively with diverse populations during emergencies is significantly enhanced. This dual focus not only improves therapeutic relations but also ensures that all aspects of patient care are addressed effectively in a multidisciplinary context. Training in these areas is essential, as it enhances disaster response capabilities. Encouraging cultural understanding and fostering interprofessional collaboration ensure that disaster nursing practices are more adaptable and responsive to the distinct needs of various communities. These practices ultimately lead to better emergency management and care outcomes. Studies emphasize the importance of these elements in improving disaster response. Hugelius and Adolfsson, through their systematic review of real-life experiences, highlight the necessity of interprofessional collaboration, while Lin et al. propose a framework for cultural competence in disaster nursing [25, 37]. These findings underscore the critical role that targeted training in cultural competence and interprofessional collaboration plays in effective disaster response.

#### **Ethics and decision-making**

Ethics and decision-making are fundamental components of disaster nursing, guiding healthcare professionals as they navigate the complexities and challenges that emerge during emergencies. By recognizing potential ethical dilemmas, pinpointing factors that encourage ethical decision-making, devising strategies for implementing ethics, and evaluating the impact of ethical practices in disaster settings, healthcare organizations and educators can better prepare nurses to make well-informed and morally responsible choices under pressure. Integrating ethics into nursing education, institutional policies, and disaster preparedness plans empowers nurses to maintain ethical standards and provide empathetic care, even amid the most demanding situations. Nurses prepare for and respond to emergencies, disasters, conflicts, epidemics, pandemics, social crises, and conditions of scarce

resources. The safety of those who receive care and services is a responsibility shared by individual nurses and the leaders of health systems and organizations. This involves assessing risks and developing, implementing, and resourcing plans to mitigate these. Several studies underscore the importance of ethics and decision-making in disaster nursing. For instance, a model for disaster nursing was developed through a systematic review of real-life experiences, highlighting the ethical challenges faced by nurses during disaster response. Their findings emphasize the need for robust ethical frameworks and support systems to guide nurses in making difficult decisions [25]. Similarly, core competencies in disaster nursing, which include ethical decision-making as a crucial domain, were identified. It is suggested that integrating ethical training into disaster preparedness programs can enhance nurses' ability to handle ethical dilemmas effectively [20]. They suggest that integrating ethical training into disaster preparedness programs can enhance nurses' ability to handle ethical dilemmas effectively.

#### **Conclusion**

This umbrella review examines strategies to tackle nursing challenges in disaster preparedness and response, consolidating the findings into nine key themes: Education and Training, Research and Development, Policy and Organizational Support, Technological Advancements, Psychological Preparedness and Support, Assessment and Evaluation, Role-Specific Preparedness, Interprofessional Collaboration and Cultural Competence, and Ethics and Decision-Making. To enhance disaster nursing, Education and Training should emphasize core competency domains and integrate them into curricula and drills, while Research and Development should be nurse-centric, improving resource allocation and evidence quality. Policy and organizational support should encourage collaboration among nursing staff, healthcare organizations, and governments, reinforcing hospital policies and addressing global nursing shortages. Technological advancements, such as virtual reality and e-learning, hold the potential to transform disaster nursing education. Psychological preparedness and support are essential for nurses' well-being and resilience, and assessment and evaluation frameworks are crucial for identifying gaps and areas for improvement. Role-specific preparedness equips nurses with the necessary knowledge and skills for various emergencies. Interprofessional collaboration and cultural competence promote a comprehensive and inclusive approach to emergency response, and ethics and decision-making guide healthcare professionals in navigating complexities during disasters. This review aims to inform future research, policy, and practice, ultimately enhancing disaster preparedness and response, patient care, and outcomes during emergencies.

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### Declarations

#### Ethics approval and consent to participate

Not applicable.

#### Consent for publication

Not applicable.

#### Informed consent

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The author declares no competing interests.

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