

Online supplementary materials

Table1. Data extraction table – features and main results of the studies included in the literature review.

Title			
Cross-sectional survey of the disaster preparedness of nurses across the Asia-Pacific region (19)			
Author	Kim Usher <i>et al.</i>	Year of Publication	2015
Journal	<i>Nursing and Health Sciences</i>	Country of Origin	7 regions in the Asia-Pacific (Bangladesh, Bhutan, Cambodia, China, Laos, Nepal, and Solomon Islands)
Setting	Hospital	Study Design	Cross-Sectional
Timing	-	Tool	DPET (Disaster Preparedness Evaluation Tool-validated questionnaire)
Sample Size	747 critical care nurses		
Outcome and Main Results	Evaluation of Asia-Pacific nurses' perception of their knowledge, skills, and preparedness for disaster management. Results: Moderate preparedness. Low participation in continuous disaster management training. Higher skill scores recorded among older participants and those with prior disaster experience.		
Title			
Disaster Preparedness in Philippine Nurses (31)			
Author	Leodoro J. Labrague <i>et al.</i>	Year of Publication	2016
Journal	<i>Journal of Nursing Scholarship</i>	Country of Origin	Philippines
Setting	Hospital	Study Design	Cross sectional
Timing	April to July 2014	Tool	Closed-ended questionnaire
Sample Size	200 critical care nurses		
Outcome and Main Results	Evaluation of perceived disaster preparedness levels among nurses in the Philippines and their roles during disasters.		

	Results: Inadequate readiness to handle a disaster event. Additional training - including scenario-based simulations – is necessary.		
Title			
Japanese nurses’ perception of their preparedness for disasters: Quantitative survey research on one prefecture in Japan (33)			
Author	Seher Deniz Öztekin et al.	Year of Publication	2016
Journal	Japan Journal of Nursing Science	Country of Origin	Japan
Setting	6 hospitals (3 public hospitals and 3 private hospitals)	Study Design	Cross-sectional
Timing	2015	Tool	DPET (Disaster Preparedness Evaluation Tool - validated questionnaire)
Sample Size	902 critical care nurses		
Outcome and Main Results	Analysis of nurses’ perception of skills, knowledge, and preparedness in disaster settings. Results: Appropriate participation in disaster training courses, but a high percentage (93%) reported feeling unprepared to respond to various catastrophic events. Practical exercise and the development of a national disaster nursing curriculum are necessary.		
Title			
Indonesian nurses’ perception of disaster management preparedness (20)			
Author	Martono et al.	Year of Publication	2018
Journal	Chinese Journal of Traumatology	Country of Origin	Indonesia
Setting	Hospital	Study Design	Cross-Sectional
Timing	2018	Tool	DPET (Disaster Preparedness Evaluation Tool - validated questionnaire)
Sample Size	1341 critical care nurses		
Outcome and Main Results	Evaluation of Indonesian nurses' perception of their knowledge, skills, and preparedness for disaster management. Results: Disaster preparedness levels in Indonesia remain very low. Nurses with prior disaster experience report better preparedness,		

	highlighting the need for continuous training to improve overall readiness.		
Title			
The knowledge, skill competencies, and psychological preparedness of nurses for disasters: A systematic review (32)			
Author	Nizar B. Said <i>et al.</i>	Year of Publication	2019
Journal	International Emergency Nursing	Country of Origin	China
Setting	Hospital	Study Design	Systematic review
Timing	January 2001- August 2018	Tool	-
Sample Size	12 studies included,1443 critical care nurses		
Outcome and Main Results	Evaluation of disaster preparedness in terms of knowledge, skills, and essential psychological features to identify possible causes of poor preparedness and to generate implications for future research. The study also highlights essential competencies in disaster nursing.		
Title			
Knowledge, Attitude and Performance Associated with Disaster Preparedness in Iranian Nurses: A Systematic Review and Meta-Analysis (26)			
Author	Kosar Yousefi <i>et al.</i>	Year of Publication	2019
Journal	Advanced Journal of Emergency Medicine	Country of Origin	Iran
Setting	Hospital	Study Design	Systematic review and meta-analysis
Timing	No time limit, up to May 2019	Tool	-
Sample Size	3 studies included, 586 critical care nurses		
Outcome and Main Results	Evaluation of knowledge levels, aptitude, and performance related to disaster preparedness in Iranian nurses. Results: Moderate knowledge levels regarding disaster preparedness.		
Title			
Development and evaluation of multimodality simulation disaster education and training program for hospital nurses (35)			
Author	Jiyoung Noh <i>et al.</i>	Year of Publication	2020
Journal	International Journal of Nursing Practice	Country of Origin	South Korea

Setting	Emergency Department	Study Design	Qualitative study
Timing	October to December 2016	Tool	Closed-ended questionnaire
Sample Size	40 emergency nurses		
Outcome and Main Results	Development of a multimodal simulation program for hospital nurses to improve disaster competencies and evaluation of its effect using the Kirkpatrick model. Results: Significant improvement in disaster-related competencies.		
Title			
Hospital Nurses' Disaster Competencies (21)			
Author	Mahdiye Nejadshafiee <i>et al.</i>	Year of Publication	2020
Journal	Trauma Monthly	Country of Origin	Iran
Setting	Critical care/Emergency Department	Study Design	Cross-sectional
Timing	January to March 2018	Tool	NCDS (Nurse Competence Disaster Scale)
Sample Size	142 critical care nurses		
Outcome and Main Results	Evaluation of nurses' competency levels in disasters and identification of factors associated with their preparedness. Results: Strong association between competency, gender, past experiences, and participation in drills. Encouraging nurses to acquire more disaster-related skills is necessary.		
Title			
Nurses' Readiness for Emergencies and Public Health Challenges- The Case of Saudi Arabia (29)			
Author	Mohammed Ali Salem Sultan <i>et al.</i>	Year of Publication	2020
Journal	Sustainability	Country of Origin	Saudi Arabia
Setting	Critical care/Emergency Department	Study Design	Cross-sectional
Timing	2020	Tool	EPIQ (validated questionnaire)
Sample Size	200 emergency nurses		

Outcome and Main Results	Theoretical and practical evaluation of nurses' preparedness for major incidents and disasters (MID) in southern Saudi Arabia through a validated questionnaire. Results: Good theoretical preparedness but low confidence in practical skills. More training through scenario-based simulations is necessary.		
Title			
Simulation in disaster nursing education: A scoping review (27)			
Author	Cong Geng <i>et al.</i>	Year of Publication	2021
Journal	<i>Nurse education today</i>	Country of Origin	China
Setting	Hospital	Study Design	Systematic review
Timing	2010-2020	Tool	-
Sample Size	24 studies included		
Outcome and Main Results	Evaluation of the effectiveness of simulation methods in disaster nursing education. Results: Simulation-based training is effective but there is a need for improved evaluation tools to assess its long-term impact.		
Title			
Disaster Preparedness and Associated Factors Among Emergency Nurses in Guangdong Province, China: a Descriptive Cross-Sectional Study (22)			
Author	Jia Wang <i>et al.</i>	Year of Publication	2021
Journal	<i>Disaster Medicine and Public Health</i>	Country of Origin	China
Setting	Critical care/Emergency Department	Study Design	Cross-Sectional
Timing	August 21, 2018 – August 31, 2018	Tool	DPET-MC (Modified, validated DPET questionnaire)
Sample Size	633 emergency nurses		
Outcome and Main Results	Evaluation of disaster preparedness and the factors influencing readiness in Guangdong Province, China. Results: Identification of six key factors affecting disaster preparedness: age, gender, disaster training experience, disaster drill experience, resource availability, and education level. Opportunity is shown to enhance training programs - such as disaster scenario-based simulations - to improve preparedness, to provide psychological support, and to address safety considerations.		

Title			
Virtual Reality Simulation for Disaster Preparedness Training in Hospitals: Integrated Review(16)			
Author	Younhyun Jung Dphil	Year of Publication	2022
Journal	Journal of medical internet research	Country of Origin	South Korea
Setting	Hospital	Study Design	Systematic review
Timing	2007-2022	Tool	-
Sample Size	12 studies included		
Outcome and Main Results	Integrative literature review on the application of virtual reality for disaster preparedness training in hospitals needs to be conducted.		
Title			
Psychometric Properties of Disaster Preparedness Tools in Nurses: A Systematic Literature Review (34)			
Author	Bilge Kalanlar	Year of Publication	2022
Journal	Cambridge University Press	Country of Origin	Turkey
Setting	Hospital	Study Design	Systematic review
Timing	January 2010 – June 2021	Tool	-
Sample Size	6 studies included		
Outcome and Main Results	Evaluation of the psychometric properties of developed or adapted scales for the assessment of nurses' preparedness in case of sudden-impact natural disasters. Results: The need for content expansion and the development of new evaluation scales is identified.		
Title			
Disaster preparedness and core competencies among emergency nurses: A cross-sectional study (30)			
Author	Zahra Chegini et al.	Year of Publication	2022
Journal	Nursing Open Wiley	Country of Origin	Iran
Setting	Critical care/Emergency Department	Study Design	Cross-Sectional

Timing	August 2020 - December 2020	Tool	NPDCC (Nurses’ perception disaster core competencies - validated questionnaire)
Sample Size	271 emergency nurses		
Outcome and Main Results	Evaluation of disaster core competencies and preparedness among emergency nurses. Results: Higher competencies found in personnel with prior disaster experience, higher education, and older age. Educational programs and drills to improve nurses’ disaster-related knowledge and skills are necessary.		
Title			
Disaster preparedness knowledge and its relationship with triage decision-making among hospital and pre-hospital emergency nurses - Ardabil, Iran (23)			
Author	Islam Azizpour <i>et al.</i>	Year of Publication	2022
Journal	<i>BMC Health Services Research</i>	Country of Origin	Iran
Setting	Critical care/Emergency Department	Study Design	Cross-sectional
Timing	March – April 2021	Tool	EPIQ + TDMI (validated questionnaires)
Sample Size	472 emergency nurses		
Outcome and Main Results	Evaluation of disaster preparedness levels and their connection with triage decision-making among emergency nurses in Ardabil Province. Results: Better preparedness among trained personnel. The importance of triage during disasters is highlighted. Enhanced staff training programs are necessary.		
Title			
Effect of Educational Program on Knowledge, Skills, and Personal Preparedness for Disasters Among Emergency Nurses: A Quasi-Experimental Study (28)			
Author	Razan M. Al-qbelat <i>et al.</i>	Year of Publication	2022
Journal	<i>The Journal of Health Care Organization, Provision and Financing</i>	Country of Origin	Jordan
Setting	Emergency Department	Study Design	Quasi-experimental study
Timing	May – June 2021	Tool	DPET (Disaster Preparedness

			Evaluation Tool - validated questionnaire)
Sample Size	50 emergency nurses		
Outcome and Main Results	Evaluation of the effect of the educational program on knowledge, skills, and personal preparedness for disasters among emergency nurses. Results: The educational program improved knowledge, skills, and personal preparedness. However, overall preparedness levels remained modest.		
Title			
Nurses’ knowledge levels and preparedness for disasters: A systematic review (18)			
Author	Filiz Tas <i>et al.</i>	Year of Publication	2022
Journal	<i>International Journal of Disaster Risk Reduction</i>	Country of Origin	Turkey
Setting	Hospital	Study Design	Systematic review
Timing	2015-2019	Tool	-
Sample Size	17 studies included		
Outcome and Main Results	Evaluation of nurses' knowledge levels, competencies, and preparedness for disasters. Results: The need to develop specific and adequate training programs is identified.		
Title			
Sustainable disaster risk reduction training model for nurses: a descriptive qualitative approach (24)			
Author	Achir Yani S. Hamid <i>et al.</i>	Year of Publication	2023
Journal	<i>Nurse education in practice</i>	Country of Origin	Indonesia
Setting	Critical care	Study Design	Qualitative study
Timing	2022	Tool	Literature review, focus groups, and expert group discussions
Sample Size	6 studies included, 7 critical care nurses		
Outcome and Main Results	Development of a feasible training model for nurses on disaster risk reduction, identifying a structured three-level training course.		

Title			
Jordanian Nurses' Perceived Disaster Preparedness: Factors Influencing Successful Planning (25)			
Author	Mohammad O. Abu Hasheesh	Year of Publication	2023
Journal	Hindawi	Country of Origin	Jordan
Setting	Critical care/Emergency Department	Study Design	Cross-Sectional
Timing	-	Tool	Closed-ended questionnaire
Sample Size	240 critical care nurses		
Outcome and Main Results	Analysis of Jordanian nurses' perception regarding disaster preparedness. Results: Good theoretical preparedness concerning disasters but poor practical skills. More scenario-based simulation training is necessary.		
Title			
Assessing disaster preparedness of emergency nurses in Saudi Arabia: A study on educational needs (36)			
Author	Ashwaq A. Almutairi et al.	Year of Publication	2024
Journal	International Journal of Advanced and Applied Sciences	Country of Origin	Saudi Arabia
Setting	Emergency Department	Study Design	Cross-Sectional
Timing	-	Tool	EPIQ (validated questionnaire)
Sample Size	29 emergency nurses		
Outcome and Main Results	Evaluation of disaster preparedness levels and self-perceived competence among emergency nurses in Saudi Arabia. Results: Lack of knowledge is detected. A 30-hour training course set on evaluation results is required. The development of new preparedness methods is necessary.		
Title			
Overcoming challenges in nursing disaster preparedness and response: an umbrella review (17)			
Author	Abdullellah Al Thobaity	Year of Publication	2024
Journal	BMC Nursing	Country of Origin	Saudi Arabia

Setting	Hospital	Study Design	Systematic review
Timing	-	Tool	-
Sample Size	24 studies included		
Outcome and Main Results	Analysis of nine specific strategies to improve nurses’ training concerning disaster preparedness and response. Results: Integrating core competencies domains into training and drills reinforces practical skills, ensuring efficient and effective disaster response in real-life situations.		
Title			
Assessment of the effectiveness of hospital external disaster functional drills on health care receivers’ performance, using standardized patients and mass cards simulation: a pilot study from Saudi Arabia (15)			
Author	Nidaa Bajow <i>et al.</i>	Year of Publication	2024
Journal	<i>BMC Emergency Medicine</i>	Country of Origin	Saudi Arabia
Setting	Critical care	Study Design	Quasi-experimental study
Timing	December 19, 2022	Tool	Closed-ended questionnaire
Sample Size	22 emergency nurses		
Outcome and Main Results	Evaluation of critical care staff performance through a large-scale simulation and assessment of drill effectiveness using actors and MAC-SIM cards. Results: The potential of large-scale simulations to improve hospital teams' knowledge and performance in disaster response is highlighted.		

Table 2. Validated questionnaires for self-perceived disaster preparedness evaluation in nurses.

Questionnaire	Objective	Strengths	Weaknesses
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EPIQ (Emergency Preparedness Information Questionnaire)	Evaluating nurses' self-perceived preparedness levels to identify strengths and weaknesses with the aim of targeted training intervention.	• Clear structure (6 defined areas of investigation). • It covers a wide range of disaster-related competencies. • It uses a familiarity scale (1-5) for quick and easy completion. • It allows rapid identification of weaknesses and crucial aspects. • Adaptable to various geographical and cultural contexts.	• Moderately long completion time. • It may require frequent update to include emerging competencies. • It lacks a psychological component.
DPET (Disaster Preparedness Emergency Tool)	Evaluating nurses' self-perceived disaster preparedness levels to identify weaknesses and to implement targeted training.	• Clearly structured into thematic areas. • It covers a wide range of competencies, with a particular focus on triage and bioterrorism. • It uses a 6-point scale for more nuanced answers. • It clearly identifies training deficiencies.	• Completion time may be long. • It requires basic knowledge for some questions (less suitable for inexperienced staff). • It needs periodic update to align with new evidence and technologies.
TDMI (Triage Decision-Making Inventory)	Evaluating triage decision-making skills during mass casualty incidents to identify training needs for triage capacity development.	• It covers a wide range of relevant skills (intuition, experience, etc.). • High content validity and statistical reliability. • Applicable to other clinical settings for assessing decision-making competencies.	• Long completion and analysis time. • Primarily tested on emergency nurses (limited generalizability). • "Intuition" is difficult to quantify and less relevant for beginners. • It requires adaptation for different cultural and work environments.

NCDS (Nurse Competencies Disaster Scale)	Identifying competence weaknesses to guide targeted training program development.	• Clearly divided into thematic areas. • High content validity and statistical reliability. • It covers a wide range of disaster-related skills. • It includes psychological components (stress management and psychological support).	• It requires prior disaster training (complex for beginners or those without specific education). • The assessment of psychological competencies may be influenced by subjective bias. • It needs update to align with new evidence and technologies.
NPDC (Nurse Competencies Disaster Scale)	Evaluating self-perceived competence levels in managing mass casualty incidents to identify strengths and weaknesses aimed at targeted training intervention.	• It evaluates a wide range of essential disaster management competencies (technical and psychological). • Adaptable to various clinical hospital settings and nurses with different experience levels. • It includes stress management and psychological support.	• It may require long completion time. • It needs adaptation for non-hospital settings. • It requires update to align with emerging evidence and technologies.