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What is Disaster Readiness Among Health Care Professionals? A Systematic Integrative Review Study

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Systematic Review

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Abstract

Objective: This study aimed to explore the meaning of disaster readiness among health care professionals.

Methods: A systematic, integrative literature review was conducted on PubMed, Chinal plus with full text, Web of Science, PsychInfo, and Scopus. Quality appraisal was conducted using the CASP checklists.

Results: A total of 22 scientific articles were included. Disaster readiness, from the perspectives of health care professionals, was defined as having sufficient skills and confidence to respond, having access to the necessary equipment, being able to adapt to the changing environment and organizational structure, and being willing to serve in a disaster.

Conclusions: Disaster readiness is more than being prepared. Disaster readiness means moving beyond technical skills and knowledges to include personal mental preparedness and a willingness to confront the risks and take necessary precautions to stay safe and resilient in the efforts to help others. To enhance disaster readiness, preparations should include introducing elements that touch the soul, providing moral and personal motivation to serve in a disaster, and initiating thoughts on what such deployments or situations could be like for those affected as well as for health care professionals. How to enhance such trainings and develop effective training methods must be a focus for future studies.

In 2023, over 93 million people globally were affected by natural or man-made disasters.[1] Despite the considerable human suffering caused by disasters, economic and environmental values are difficult to estimate. Disaster management can be described in 4 phases: prevention, preparedness, response, and recovery.[2] Recently, research interest in disaster preparedness, particularly disaster nursing research, has been increasing.[3] Disaster preparedness has been defined in several ways. The European Union defines it as "a set of measures undertaken in advance by governments, organizations, communities, or individuals to better respond and cope with the immediate aftermath of a disaster, whether it be human-induced or caused by natural hazards. The objective is to reduce the loss of life and livelihoods'.[4] The United Nations Office for Disaster Risk Reduction (UNDRR) defines it as "the knowledge and capacities developed by governments, response and recovery organizations, communities, and individuals to effectively anticipate, respond to, and recover from the impacts of likely, imminent, or current disasters."[5] These definitions imply that disaster preparedness can be seen from a strategic, community, or individual perspective. Most scientific research has, so far, focused on household disaster preparedness, such as physical or material preparations.[6] Recently, research on households´ psychological or mental preparedness has been associated with material preparedness, effective stress management, and decreased likelihood of experiencing mental health problems in the aftermath.[6] Within health care services, disaster preparedness has been mainly explored from the viewpoints of competence or training and organizational and contingency planning.[7]

However, recently, the term disaster readiness has been introduced as an alternative to the concept of disaster preparedness.[8–10] For example, the Covid-19 pandemic has shown the importance of fostering robust readiness for not only pandemics but also other disasters among health care professionals.[8] All types of disaster preparedness activities, such as trainings or education sessions, lead to improvements in knowledge, skills, or attitude preparedness for disasters.[9] As for the concept of disaster preparedness, disaster readiness has not been fully defined or described. The term "readiness" has been described as a willingness or a state of being prepared for something[10] and as a concept extending the dominant paradigm of disaster preparations for survival, such as physical preparations, and includes mental and existential aspects of preparedness and the perspectives of recovery and resilience in the context of being personally affected by a disaster.[11] According to Gowan et al.,[11] disaster readiness includes asking questions such as "am I ready in thought" (related to risk awareness), "am I ready in belief?"

(related to self-confidence in one's ability to manage disasters and self-awareness of coping strategies), and "am I ready in action?" (related to practical and mental preparedness). This description of disaster readiness touches upon psychological preparedness, but because neither of these concepts is fully explored or defined, there is room for further research. Despite the increased scientific interest in disaster preparedness within health care services, disaster readiness among health care professionals has rarely been considered,[7] and the difference between the 2 concepts is seldom discussed.[11] Therefore, this study aims to explore what disaster readiness among health professionals is and entails.

Methods

Design

A systematic, integrative literature review[12] was conducted. The PRISMA guidelines were followed.

Search Methods

Systematic searches in PubMed, Chinal plus with full text, Web of Science, PsychInfo, and Scopus were conducted by one of the authors (KH) and an academic librarian on March 19, 2024. Search terms included MeSH terms, other indexed terms, and free text searches (Table 1). The article selection was conducted using the Covidence systematic review software (Veritas Health Innovation, Melbourne, Australia) to identify duplications, assess the papers for inclusion, and sort the papers. Inclusion was based on the following eligibility criteria: (a) articles describing or defining disaster readiness, including psychological preparedness, willingness, or other personal preparations; (b) articles covering the perspective of health care professionals or health care professional students; (c) articles published in English; and (d) articles using a qualitative, quantitative, or mixed-methods design. Articles were excluded if they (a) were published as editorial or similar texts; (b) were review studies; (c) covered the general population or communities or professions other than health care; and (d) only reported on organizational perspectives. The selection of studies was primarily made by the first author (KH) and validated by the academic librarian by random checking against inclusion and exclusion criteria.

Seach outcomes

The search retrieved 2542 articles from PubMed (n = 1223), Chinal Plus with full text (n = 343), PsychInfo (n = 33), and Web of Science (n = 943) (Table 1). After removing duplicates, 2143 articles remained and were screened by title and abstract; thereafter, 163 papers were screened by full text. Of these, 141 were excluded (see Figure 1). Ultimately, 22 articles were included. The selection process is shown in the PRISMA flowchart (see Figure 1).

Quality appraisal

The quality appraisal was conducted using the CASP Cohort Study Checklists (2020) (the Qualitative Studies Checklist or Cohort Study Checklist, depending on the study design). All studies were comprehensively assessed by both authors independently in terms of their methodological and theoretical rigor, and an overall quality appraisal as "moderate quality" or "high quality" was used.[12,13] Quantitative studies were assessed as "yes," "no," or "can´t tell." Studies with a mix of "yes" and "no" or "can´t tell" were considered moderate overall quality. Studies with all "yes" were considered high quality. Qualitative studies with a mix of "yes" and "no" or "can´t tell" were considered moderate overall quality. Studies with all "yes" were considered high quality. The results of the quality appraisal are shown in Supplementary Table 1.

Analysis

An integrative analysis[12] was conducted. First, data related to specific research questions were extracted from the selected articles. Thereafter, each research question was analyzed independently using both qualitative and quantitative data sorted and integrated into themes. Finally, a comprehensive analysis of the data relevant to the aim of the study was conducted, and a concept description of disaster readiness was defined and described.

Results

In total, 22 papers formed the basis for the results. Of these, 10 used a quantitative study design with surveys to collect data, 11 used a qualitative design with interviews to collect data, and 1 study used a mixed-methods design. In all, 3734 health care professionals participated in the study, of which 2281 were nurses and the others varied from physicians to dentists, pharmacists, or students. The studies were mainly conducted within an emergency or general hospital care context (n = 15), followed by community care, public health care, operation theaters, and educational settings. The studies were conducted in Asia (n = 10), the Middle East (n = 9), and Europe (n = 3) (Supplementary Table 2) An overview of the studies' contribution for each theme is shown in Table 2.

Components of Disaster Readiness Among Health Care Professionals

The concept of disaster readiness for health care professionals involved 5 elements, of which 4 were related to the concept of disaster preparedness (Figure 2).

Having access to sufficient equipment and nourishment

A concrete component of disaster preparedness on an organizational level, strongly influencing the preparedness of health care professionals, was to ensure that these professionals had access to adequate equipment to provide essential care. Such equipment included general relief supplies, specific medical equipment, and personal equipment, such as protective gear.[14–18] In addition to medical and protective gear, the provision of food and drinks was essential for an appropriate response. Health care professionals are expected to make such arrangements themselves to ensure their self-sufficiency for the first period of their duty.[18–20] Access to adequate equipment was also determined based on the availability of sufficient logistic supply chains.[21,22] If there is no access to adequate equipment, the health care professionals must to use their creativity without compromising patient safety.[21]

Understanding and trusting organizational structures and management systems

Another component of disaster preparedness relevant for individual health care professionals was understanding and trusting the modified organizational structures and management systems used in disasters.[15,23] To enable this, a clear command and control system was essential.[18,21,24,25] Lack of clarity of such systems, or trust in them, could result in a less efficient response to the disaster.[14,21] An important part of the management systems was

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Table 1. Systematic search

PubMed 2024-03-19		
Searchterms		*n*
Disaster		
1.	((((((((((((((((((disaster[MeSH Terms]) OR (planning, disaster[MeSH Terms])) OR (Disaster Management[MeSH Terms])) OR (Emergency Preparedness[MeSH Terms])) OR (Disaster Relief Planning[MeSH Terms])) OR (Relief Planning, Disaster[MeSH Terms])) OR (Mass Casualty Incidents[MeSH Terms])) OR (Mass Shooting Events[MeSH Terms])) OR (Medical Countermeasures[MeSH Terms])) OR (Natural Disasters[MeSH Terms])) OR (Cyclonic Storms[MeSH Terms])) OR (droughts[MeSH Terms])) OR (earthquakes[MeSH Terms])) OR (floods[MeSH Terms])) OR (landslides[MeSH Terms])) OR (tidal waves[MeSH Terms])) OR (tornadoes[MeSH Terms])) OR (Wildfires [MeSH Terms])	112 646
Preparedness		
2.	(((preparedness[Title/Abstract]) OR (ready[Title/Abstract])) OR (readiness[Title/Abstract])) OR (willingness[Title/Abstract])	125 370
Health professionals		
3.	((((((((((health occupations[MeSH Terms]) OR (nurse*[Title/Abstract])) OR (physician*[Title/Abstract])) OR (occupational health therapist* [Title/Abstract])) OR (physiotherapist[Title/Abstract])) OR (pharmacist[Title/Abstract])) OR (dentist*[Title/Abstract])) OR (nurse student*[Title/Abstract])) OR (medical student[Title/Abstract])) OR ("health professionals"[Title/Abstract])	2 599 687
Combined sets		
4.	1 AND 2 AND 3	2590
Limits: English, publication year 10 years		
5.		1223
Web of science 2024–03–19		
1	TS=(disaster* OR Mass Casualty Incident* OR Mass Shooting Event* OR Natural Disaster* OR Cyclonic Storms OR Droughts OR Earthquake* OR Floods OR Landslides OR Tornadoes OR Wildfires OR Tidal Waves OR Tornadoes OR Typhoon OR mudslide OR brush fire)	534 939
2.	TS=(Disaster Planning OR preparedness OR ready OR readiness OR willingness OR disaster relief planning)	178 288
3.	TS=(Health Occupations OR Nurse* OR Physician* OR Physical Therapist* OR Pharmacist* OR Dentist* OR nursing student* OR medical student* OR health occupation*OR health professional)	480 014
4.	1 AND 2 AND 3	943
5.	Limits: English, publication year 2014–2024	943
Scopus 2024–03–19		
1.	(TITLE-ABS-KEY ((disaster* OR “mass casualt*” OR “mass shooting*” OR “natural disaster*” OR avalanche* OR cyclon* OR “drought*” OR earthquake* OR flood* OR landslide* OR “tidal wave*” OR tornado* OR wildfire* OR hurricane* OR “tropical storm*” OR typhoon* OR rockslide* OR mudslide* OR tidalwave* OR “forest fire*” OR “wild fire*” OR “brush fire*” OR “wildland fire*”))	867 637
2.	TITLE-ABS-KEY ((“medical countermeasure*” OR preparedness OR ready OR readiness OR willingness OR “disaster management”))	375 908
3.	TITLE-ABS-KEY ((“health occupation*” OR “health professional*” OR nurse* OR physician* OR “occupational therapist*” OR “physiotherapist*” OR “physical therapist*” OR pharmacist* OR dentist* OR “nursing student*” OR “nurse student*” OR “medical student*”))	2 330 494
4.	1 AND 2 AND 3	5686
5.	PUBYEAR > 2012 AND PUBYEAR < 2025 AND (LIMIT-TO (LANGUAGE, “English”	1211
CINAHL Full text 2024–03–19		
1.	(MH “Disaster Planning”) OR (MM “Disasters”) OR (MM “Natural Disasters”) OR (MM “Mass Casualty Incidents”) OR “disaster”)	31 524
2.	(MH “Disaster Planning”) OR “preparedness” OR “readiness” OR “ready” OR “willingness”	65 496
3.	MH “health professional” OR (MH “Health Personnel”) OR (MH “Health Occupations”) OR (MM “Nurses”) OR (MM “Physicians”) OR (MM “Pharmacists”) OR (MM “Medical Staff”) OR (MM “Dentists”) OR (MM “Occupational Therapists”) OR (MM “Physical Therapists”) OR (MM “Students, Nursing”) OR (MM “Students, Medical”)	191 632
4.	1 AND 2 AND 3	723
	Peer Reviewed; English Language; Publication Date: 20140101–20241231	343
PsychInfo 2024–03–19		
1.	(MH “Disaster Planning”) OR (MM “Disasters”) OR (MM “Natural Disasters”) OR (MM “Mass Casualty Incidents”) OR “disaster”)	15 467
2.	(MH “Disaster Planning”) OR “preparedness” OR “readiness” OR “ready” OR “willingness”	70 818

(*Continued*)

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Table 1. (*Continued*)

PubMed 2024-03-19		
3.	MH "health professional" OR (MH "Health Personnel") OR (MH "Health Occupations") OR (MM "Nurses") OR (MM "Physicians") OR (MM "Pharmacists") OR (MM "Medical Staff") OR (MM "Dentists") OR (MM "Occupational Therapists") OR (MM "Physical Therapists") OR (MM "Students, Nursing") OR (MM "Students, Medical")	46 302
4.	1 AND 2 AND 3	69
5.	Peer Reviewed; Publication Date: 20140101–20231231 Language: - english	33

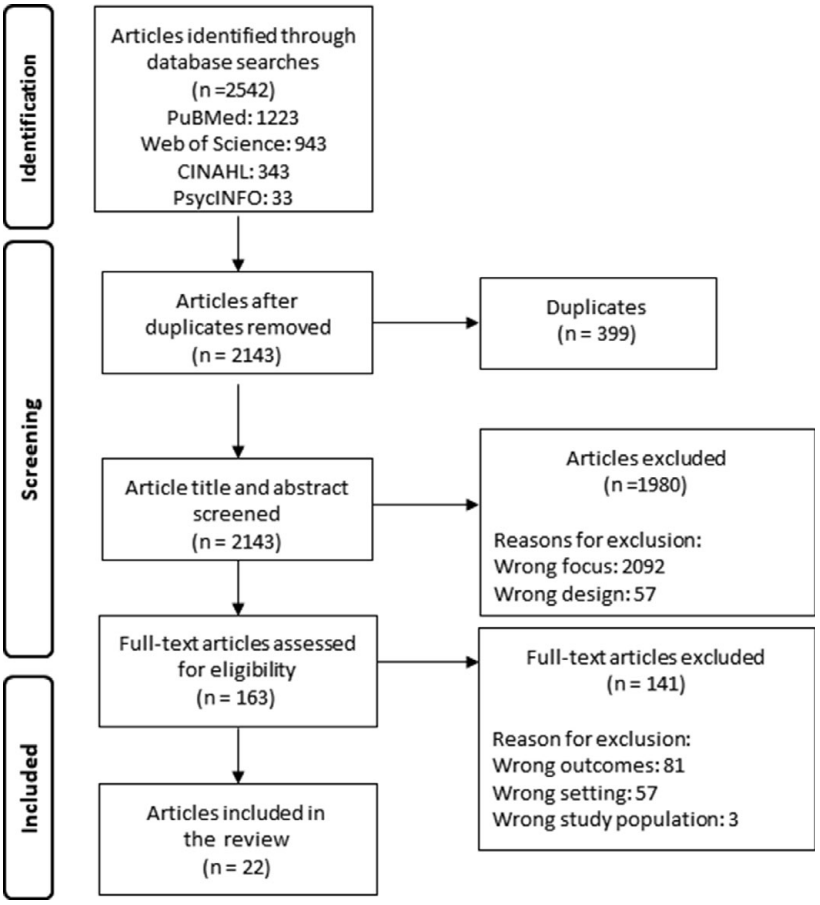

Figure 1. Overview of search outcomes and inclusion process.

the ability to manage not only the scarcity of response resources but also their overflow.[21,25]

Having sufficient technical and non-technical skills

A central component in disaster preparedness was professional competence, including knowledge and training in disaster medicine or nursing.[14,18,22,26] Both technical skills, such as mass casualty triage systems or international humanitarian response systems; psychological first aid; public health interventions; disaster law, ethics, and media handling; and non-technical skills, such as team work or emergency and communication skills, were mentioned as important to enhance disaster preparedness.[23,27–29] In some cases, the perceived competences of technical and non-technical skills were valued differently. For example, nurses within the emergency department rated their technical skills as high but communication skills as low.[23] Other skills mentioned as important were leadership, management and coordination, decision-making, critical thinking, autonomy, and planning.[30]

Most study participants rated their theoretical knowledge in disaster management as fair or good but lacked practical experience.[31] Another essential aspect of disaster medicine competence was that, within a short time from the actual impact of the disaster event, focus shifted from emergency care to everyday care, including pregnant women, children, and older people with acute and chronic illnesses.[14]

Being personally and mentally prepared

Several studies have emphasized professional and personal mental preparedness and personal practical preparations to enhance disaster readiness.[14–18,32,33] Such mental preparedness could be built from clinical experience,[33] but in the absence of real disaster experience, mental preparedness including both physical and

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Table 2. Overview of included papers and their contribution to the themes

	Having access to sufficient equipment and nourishment	Understand and trust organizational structure and management systems	Having sufficient technical and non-technical skills	Being personally and mentally prepared	Willingness to serve
Akbari et al 2024		X			
Al Harthi et al 2021	X			X	
Bayrak Aykan et al 2022			X		
Bayraktar & Ylidirim 2016			X		
Chegini et al 2022			X		
Choi et al 2022			X		
Farokhzadian et al 2023			X	X	
Husna et al 2021			X		
Isangula et al 2023	X	X		X	
Jang et al 2021			X	X	X
Khilji et al 2022	X			X	
Kako & Hutton 2022		X			
Kang et al 2022	X				X
Lam et al 2018			X		X
Li et al 2017	X	X	X	X	
Li et al 2015	X				
Murphy et al 2022		X			
Rostami et al 2023	X	X	X	X	
Shapira et al 2019				X	
Sultan et al 2020			X		X
Sultan (II) 2020					X
Younos et al 2021	X		X		

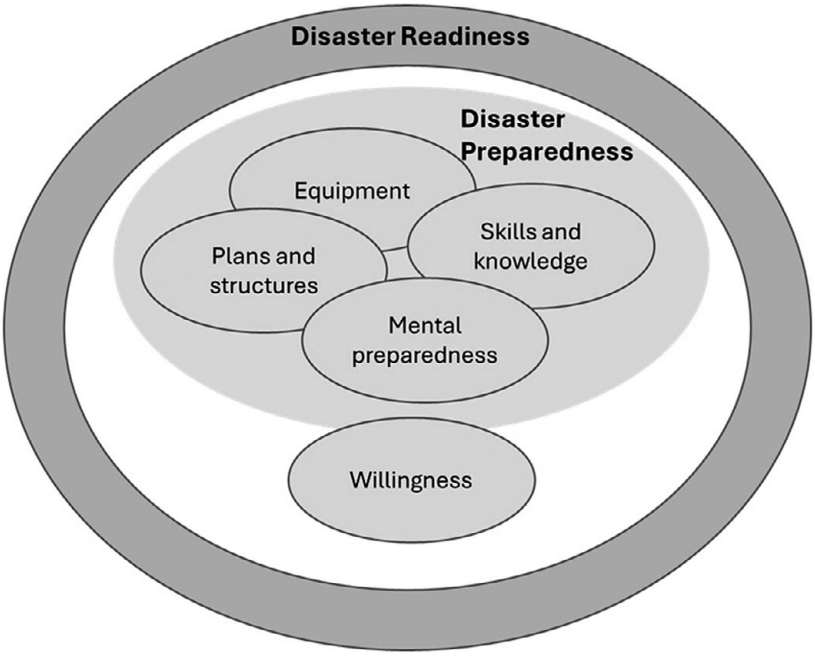

Figure 2. Overview of the results.

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mental aspects is difficult to establish.[14,32,33] Mental preparedness could contribute to decreasing stress and maintaining good decision-making skills.[16,17] Personal preparations included gathering personal necessities and making plans for how to stay in contact with family and friends,[14 15] as well as individual resilience strategies.[18,29]

Willingness to serve

Willingness to serve was not considered an integral part of disaster preparedness and was most often reported separately from such studies. However, it was addressed as essential for readiness for disaster response.[20,27,31,34,35] Willingness to respond to a disaster varies based on the type of disaster event and adherent risks.[34,36] Ensuring the safety and security for the disaster responders was considered essential for the will to respond to a disaster.[34] In particular, the safety of family members was emphasized.[35,37]

Comprehensive analysis and a step toward the description of disaster readiness

Disaster readiness is related to several other concepts, such as disaster preparedness or disaster response. Seen from the individual perspectives of health care professionals, being part of disaster preparedness, disaster readiness comprises several aspects, such as having access to necessary equipment, understanding the structure for leading and managing disasters, having sufficient skills and knowledge regarding how to provide care, and having mental preparedness to stay resilient to the demands that a disaster generates. In addition to technical preparedness focused on practical competency and mental preparations built in advance, disaster readiness also requires a willingness to serve despite potential personal risks. In addition, health care professionals need to be ready to use safety products to enable an efficient response and help others. This finding implies that being ready is more than being formally prepared.

The results enhance the interception that disaster readiness cannot be obtained with only technical preparations or training but requires personal reflection and real insights.

Discussion

Disaster readiness, from the perspectives of individual health care professionals, refers to having sufficient skills and confidence to respond, having access to the necessary equipment, being able to adapt to the changing environment and organizational structure, and being willing to serve in a disaster despite being confronted with considerable suffering and potential security threats.

Health care professionals may be deployed to a disaster event as part of their regular job, as part of a mandatory cause such as in military services, or as a voluntary duty. Related to the finding that willingness to serve is part of disaster readiness, voluntary readiness must be discussed. Most disasters entail certain risks for the responding health care professionals.[38,39] During a disaster, the response action itself implies certain risks, ranging from providing care in debris resulting from an earthquake, chemical contamination of the injured, or traumatic experiences.[40] Within their regular job or in, for example, military services, there are limited possibilities for health care professionals to refuse to serve in a disaster or crisis. In contrast, most employers aim to protect their employees from injury during work.[41] Some important questions related to disaster readiness are how to provide a "safe enough" work environment for health care professionals responding to disasters and how to balance the safety of disaster responders and victims from practical, duty of care, and moral perspectives. Ethical stress has also been identified as a specific risk for disaster responders.[42] However, none of the articles included in this review mentioned ethical, moral distress, or ethical dilemmas as part of disaster preparedness. Given that most articles referred to nurses' experiences and there are several components in disaster nursing that should raise ethical or moral concerns, such as prioritization, triage, and human rights in emergencies or risks,[43] this is an unexpected finding deserving of more scientific interest.

Nor was the concept of resilience highlighted in the included articles. Because responding to a disaster is most often highly stressful and psychologically demanding,[44,45] resilience, commonly referred to as the ability to "bounce back" after a highly demanding or stressful event,[46] appears essential for disaster responders. The concepts of resilience and psychological preparedness, which were mentioned in several articles, have several similarities. Psychological preparedness has generally been understood as comprising 2 mental dimensions: a cognitive aspect directed at the threat, involving situational awareness and adaptive responses, and a mostly affective aspect involving self-awareness and emotional regulation.[6] To understand how to promote resilience and psychological preparedness, the relationship between disaster readiness and resilience is a scientific field that needs to be further explored.

Tremendous efforts have been made to study different aspects of disaster preparedness and/or readiness among health care professionals. Given the increasing number of disasters and health crises, developing efficient ways of preparing these professionals for the challenges held by real disasters is critical. Most of the studies included in this review focused on nurses. Given that nursing is the most deployed profession in disasters,[47] this is not surprising, but raises questions on the cause for this great interest in nurses rather than health care professionals in general, and whether disaster readiness among nurses differs from disaster readiness among other health care professionals.

To know what to be ready for, it is necessary to determine what demands and skills health care professionals are exposed to when responding to a disaster. A major limitation of the studies included in this review as well as other studies on disaster preparedness[3] is that most of them did not rely on real disasters but on simulations or personal estimations of, for example, willingness. Many studies included in this study used scales or instruments to measure preparedness, readiness, and/or willingness to respond, most of which focus on self-perceived knowledge and skills.[48] This entails an essential scientific problem because the concepts measured, such as preparedness or willingness to respond, are seldom clearly defined, and the measurements are not based on real situations but on personal estimations of how the study participants will react if a real disaster event occurred.

In summary, the information on effective strategies to achieve disaster readiness among health care professionals is scarce.[7] Given the increased trend of disaster events globally, questions on how to enhance real disaster readiness among health care professionals must be prioritized. Most of the studies in this review emphasized training and education. However, most of these interventions seem to be based on traditions or experience-based methods. Research-based interventions and a close collaboration between researchers and practitioners within disaster response have previously been suggested to facilitate effective performance.[45] Thus, there is a need for scientifically developed and tested interventions to improve all aspects of disaster readiness, with a greater focus on mental and personal preparedness. To address this scientific gap, an interdisciplinary scientific approach involving scientists from disaster medicine, psychology, and pedagogy is required.

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Limitations

This study can be seen as a concept analysis. A traditional concept analysis is most often based on literature searches, sometimes combined with empirical data.[49] However, these methods seldom involve the data quality appraisal that is included in the systematic literature review methodology. The integrative review presents varied perspectives on the phenomenon of concern and can be used to define concepts.[12,50] By using the integrative review methodology, the rigor of a systematic literature study and concept analysis can be combined;[50] hence, this methodology was adopted in this study. However, we cannot be certain that all relevant papers were identified in the structured search, and more diversity in search terms available to cover the area of disaster readiness may have led to studies meeting the inclusion criteria that were not included.

Most studies were conducted in Asia or the Middle East, regions regularly exposed to disasters of different kinds. However, it may be questioned if there are specific parts of disaster readiness that can be culturally induced or influenced by differences in how health care systems are organized in different parts of the world.

The diversity of the selected articles indicates the complexity of the studied phenomenon. Many of the studies were based on experiences from Asia and the Middle East, disaster-prone areas where the consequences of disasters might be higher compared to less disaster-prone countries. Both authors were clinically and scientifically experienced in disaster contexts.

Conclusion

Disaster readiness is more than being prepared. Disaster readiness means moving beyond technical skills and knowledges to include personal mental preparedness and a willingness to confront the risks and take necessary precautions to stay safe and resilient in the efforts to help others.

To enhance disaster readiness, preparations should include introducing elements that touch the soul, providing moral and personal motivation to serve in a disaster and initiating thoughts on what such deployments or situations could be like for those affected as well as for health care professionals.

How to enhance such trainings and develop effective training methods must be focuses of future studies.

Supplementary material. The supplementary material for this article can be found at http://doi.org/10.1017/dmp.2025.58.

Data availability. The data used to support the findings of this study are available upon request from the authors.

Author contribution. KH: Conceptualization and design, literature search, quality appraisal, analysis, writing and editing of the manuscript. NH: Conceptualization, analysis, writing and editing of the manuscript. Both authors approved the final manuscript.

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Competing interest. The authors declare none.

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