Review

Disaster nursing research: A scoping review of the nature, content, and trends of studies published during 2011–2020

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1. Background

All over the world, disasters cause significant suffering, injuries, and health problems. Every year, nurses are involved in disaster preparedness, disaster response, and recovery mitigation, playing a vital role in disaster management and in helping the individuals affected by disasters [1,2]. The Covid-19 pandemic has shown the world the enormous importance of qualified and dedicated nurses who are prepared to care for individuals, families, and the community in exceptional circumstances. However, besides the pandemic, during the first six months of 2020, more than 100 other disasters occurred, affecting 50 million people [3].

Disaster nursing has been said to be "doing the most, for the least, by the fewest" [4]. The International Council of Nursing (ICN) has defined eight domains of disaster nursing competencies: preparation and planning, communication, incident management systems, safety and security, assessment, intervention, recovery, and law and ethics [2], showing that disaster nursing consists of a broad scope of knowledge, skills, and scientific interests. In addition, responding to a disaster is a highly challenging experience that affects nurses both professionally and personally [5]. Despite the long history and prevalence of disasters and the large number of affected people and health professionals involved in disaster management, the evidence base for disaster health knowledge in general is quite weak [6]. To change this, nurses are encouraged to contribute to building a robust and scientifically based foundation of knowledge around disaster nursing [2]. One important step towards an increased evidence base is to describe the current scientific interests, trends, gaps, and limitations in the available research. Scoping reviews can be used to respond to such interests by mapping the existing research in a given field in terms of its nature, content, and volume [7]. This scoping review aimed to investigate the nature, content, and trends of original disaster nursing research in the last 10 years.

2. Method

A scoping review was conducted in accordance with the steps described by Arksey and O'Malley [7] and the analysis methodology described by Sucharew and Macaluso [8].

2.1. Stage 1: Identifying the research question

In this study, the research question was defined as: What are the areas of interest, designs, study populations, and trends of original disaster nursing studies published in scientific journals in the last 10 years?

2.2. Stage 2: Identifying relevant studies (search strategy)

A structured search was conducted in the PubMed database, CINAHL Plus Full Text database, and Web of Science. The search terms used were "disaster nursing" and "disaster AND nursing" (see Table 1). The search in all three databases was conducted on January 10, 2020, and limited to original papers published in English between 2011 and 2020. In the CINAHL Plus with full text database, academic journals were marked, and in the Web of Science, the source setting of "Article" was selected.

2.3. Stage 3: Study selection

The study selection process was conducted using Covidence software (Covidence systematic review software, Veritas Health Innovation, Melbourne, Australia). All papers identified in the literature search were exported to Covidence, and duplications were searched for and removed (Fig. 1). Thereafter, all records were screened by reading the title and abstract. To be included, the original research paper had to report on a perspective of disaster nursing practice or model or be indexed with the keyword "disaster nursing". Both qualitative, quantitative, mixed methods, Delphi studies, and case reports were included. Papers were excluded if they were a literature review, an educational paper aiming to

Table 1

	Search terms	Number of records
PuBMed	S1: [disaster nursing]	2306
	S2: [disaster* AND nursing]	1697
	S3: S1 OR S2	2192
	Total	2192
CINAHL Plus with full text	S1: [disaster nursing]	1105
	S2: [disaster* AND nursing]	1105
	S3: S1 OR S2	1105
	Total	1105
Web of Science	S1: [disaster nursing]	722
	S2: [disaster AND nursing]	722
	Total	722
	Total exported to Covidence	4019

* means truncation

educate the reader, or a personal debate publication. If there were doubts about whether to include or exclude the paper, the paper was included for a full review. The full text review assessed the whole paper and its eligibility for the study. In this stage of the selection process, the exact reason for exclusion was documented (Fig. 1). In accordance with the selected method, no quality appraisal was made.[8]

2.4. Stage 4: Charting the data

After inclusion, all included studies were assessed, and information on the following details and information was extracted: author(s), year of publication, study location, aim and/or focus of the study, design and methodology used to gather data, study population, intervention type, and comparator (if any). The charting around the aim/focus of the study was inspired by the eight ICN competencies for disaster nursing.[2]

2.5. Stage 5: Collating, summarising, and reporting the results

Based on the charting, a summary of the results in writing was produced. All data from the Covidence database were imported to SPSS (IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM Corp.), where they were analysed, summarised, and visualised by basic numerical analysis of the extent, nature, and distribution of the studies included [7]. After the results were preliminarily summarised, they were presented for discussion in an academic disaster nursing course in which 20 voluntary clinical nurses participated. Some participants had professional experience in disaster nursing deployments or research activities, while others did not. The discussions were used to inform the interpretation of the results.

3. Results

In all, 247 studies were included in the review. Most were published in 2020 (48 papers), followed by 2015 (34 papers) and 2016 (30 papers), with an overall increasing trend (see Fig. 2 and Fig. 3).

3.1. Focus of the research studies

The most common areas of focus (Fig. 2 and Fig. 3) were *preparedness* or *training* among nurses or nursing students (n = 123, 50%). Within this group, some studies explored the competence needed or measured, levels of self-evaluated preparedness, and other measured levels of perceived preparedness before and after training. In addition, papers describing different concepts related to disaster training or instruments to measure disaster preparedness among nurses or nursing students were reported. Among the instruments used to measure disaster nursing preparedness, the Disaster Preparedness Perception Scale for Nurses, the
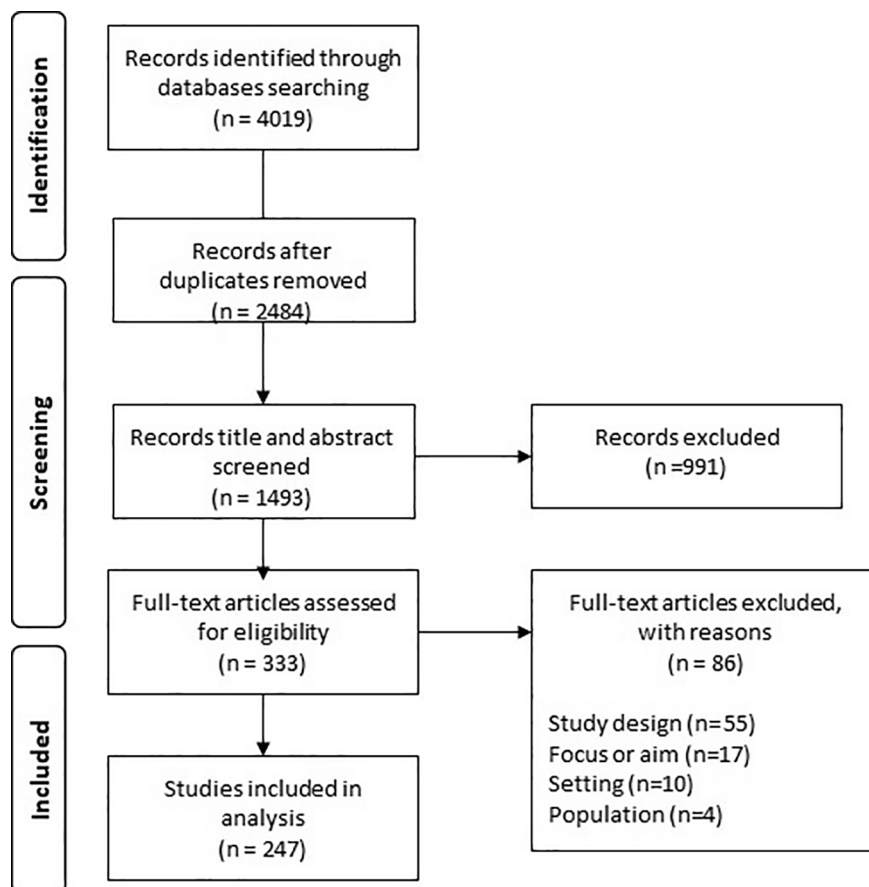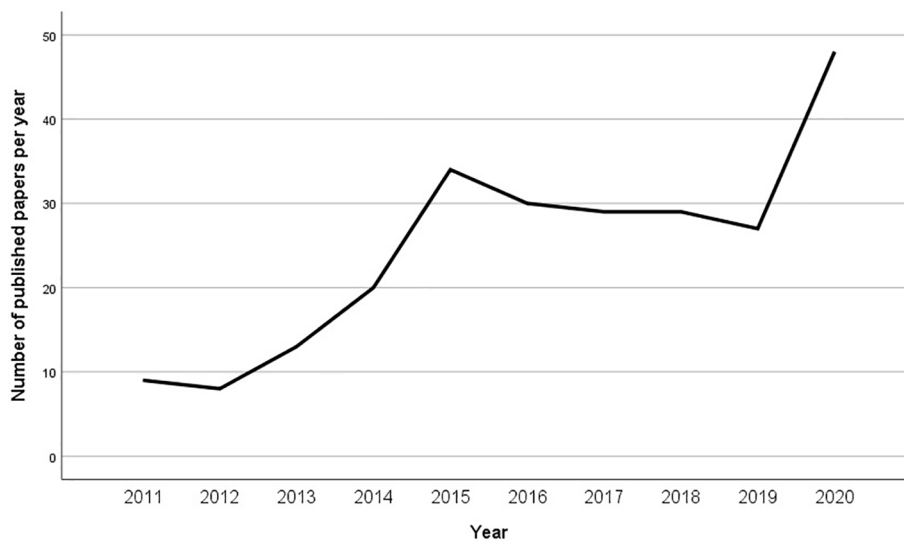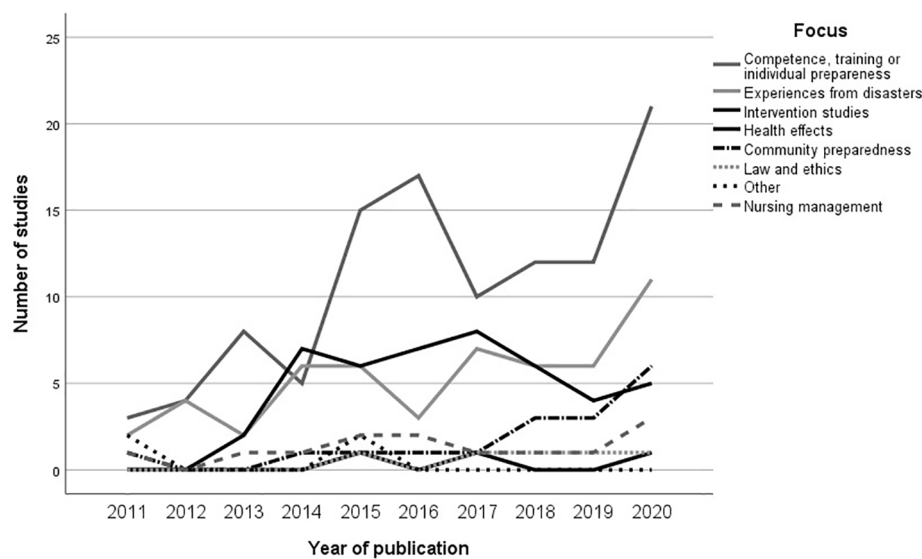

Fig. 1.

Fig. 2.

Fig. 3.

Nurses' Perceptions of Disaster Core Competencies Scale, and the Disaster Nursing Competence Assessment were used (one study per instrument).

The second most common focus was describing the *lived experiences* of authentic disasters (n = 53, 22%). Most of these papers (79%) described nurses' experiences. These experiences were mainly focused on personal and professional experience gained and were sometimes included from a personal development perspective. In addition, four papers described nursing students' experiences, and six papers described the affected peoples' experiences.

Health effects of disasters, both from a short- and long-term perspective, was the third most common focus of the disaster nursing research papers (n = 45, 18%). Among these 45 papers, the majority (37; 83%) reported on mental health aspects, such as post-traumatic stress, depression, or grief. Other outcomes used were quality of life (n = 4), injuries and physical health (n = 3), and the overall health effects resulting from evacuation from one hospital to another due to a natural disaster (n = 1). Most of the studies relied on self-rated instruments to measure health (n = 31) or individual interviews (n = 8), while six studies utilised medical records. The health outcomes of nurses (n = 10)

or nursing students (n = 1) deployed in a disaster were the focus of 11 studies, all investigating mental health effects.

In 17 papers (7%), perspectives on *community preparedness* were presented. Strategies to promote disaster preparedness in a community and to analyse community networking efforts in disaster preparedness and the role of community nurses in disasters were described.

Nursing management was presented in 13 studies (5%), covering topics such as how to organise a disaster response, with the focus on nursing homes and emergency departments; leadership strategies to enable a resilient nursing response; and perceived information needs among nurses responding to an Ebola outbreak.

Law and ethical considerations, such as experiences of ethical or moral issues or conflicts when providing care in a disaster setting, were the focus of five papers (2%), four of which pertained to authentic disaster experiences and one to disaster simulation debriefs.

Three papers (1%) evaluated the effects of specific *disaster nursing interventions*. One study evaluated the effects of a single-time intervention regarding posttraumatic stress disorder (PTSD) within a simulated study sample of 2,642,713 individuals. The second study compared three different models of teaching psychological first aid to increase

nurses' knowledge and self-efficacy, using a study sample of 30 nurses, and a third study evaluated mental health training intervention among 113 healthcare professionals in Haiti.

3.2. Disaster settings and study location

Many studies were related to training or preparedness (n = 123, 50%) with no specific authentic disaster event in focus; however, most papers referred to natural disasters (see Table 2). The category of "other" (21 studies, 8%) included two chemical events, four nuclear power events, one bus accident, one train crash, one flight crash, one mass gathering situation, two military settings, and nine studies in which no specific study setting or event was identified.

The most common study locations were the USA (n = 257, 23%), followed by China (n = 32, 13%), Iran (n = 26, 11%), Japan (n = 22, 9%), Korea (n = 11, 5%), Australia and Turkey (n = 10 each, 4%), Indonesia (n = 8, 3%), Brazil and Israel (n = 7 each, 3%), and other international settings (n = 6, 2%). All other study locations (Ghana, Greece, Haiti, Hong Kong, Iceland, Ireland, India, Island, Israel, Jordan, Liberia, Malaysia, New Zealand, Norway, the Philippines, Sweden, Taiwan, Thailand, and the United Kingdom) had fewer than five studies published.

3.3. Research designs and study populations

Most papers used a quantitative research design (n = 161, 61%). Surveys, both paper-based and online, were the most common method of gathering data for these studies (n = 155, 96% of all quantitative papers), followed by interviews (n = 3, 2%) and medical records (n = 3, 2%). For the 71 qualitative design papers (29% of all papers), individual interviews were used to gather data in 55 papers (78%), while focus groups were employed in eight studies (15%) and written personal reflections or qualitative surveys in the remaining studies. A mixed methods design was used in 10 papers (4%), nine of which (90%) used surveys combined with interviews, and one used medical records and interviews.

Nurses were the most common study population (n = 138, 56%), followed by the affected population (n = 61, 25%), nursing students (n = 39, 16%), and institutions such as universities or medical facilities (n = 9, 4%). The sample sizes also varied, from five participants to over 224,116 (not including simulated cases). The study populations for each focus area and their sample sizes are shown in Table 2.

For studies reporting on health effects from disasters, the timing of the data collection related to a particular disaster varied between 30 days and two years after the disaster, with a median time of seven months (n = 22). The data for one study was retrospectively gathered from medical records and therefore was able to accurately report the physical injuries resulting from the event. When displaying the year of publication and study focus (Fig. 3), the trend was that all focuses had increased despite studies indicating that the health effects among the affected population had decreased. Additionally, an increased interest in including nurses and nursing students in the studies could be observed between 2019 and 2020 (Fig. 4).

4. Discussion

This review showed an increasing interest in disaster nursing research, with the greatest focus on the preparedness and competence aspects. Mental health outcomes and psychosocial wellbeing dominated in the studies describing the physical health effects from disasters. When exploring the lived experiences of disasters, most studies presented such experiences from the nurses' perspective.

Disaster nursing is both a general clinical competence that all nurses should possess and a specialist competence that requires specific knowledge and skills. Reflecting on the disaster nursing competencies described by the ICN [2], this review shows that the domains of nurses'

Table 2

Study focus (N = 247)	Design (n)			Study population (n)				Sample size	Setting (n)										
	Quant	Qual	Mixed method	Nurses	Nursing students	Affected population	Institutions	median (SD) min–max	Preparedness/ training	Earthquake	Storms	Flooding	Volcano	Covid-19	Ebola	Other	Humanitarian
Preparedness (individual (n = 107)	88	13	4	69	33	1	4	262 (SD 345) 12–1782	106	0	1	0	0	0	0	0	0
Lived experiences (n = 53)	12	35	3	42	4	6	1	55 (SD 87) 5–433	0	22	13	3	0	1	1	11	2
Health effects (n = 45)	36	8	1	10	1	34	0	226 (SD 33320) 12–224 116	0	24	3	3	5	2	1	5	2
Community preparedness (n = 17)	11	5	1	3	0	14	0	16 (SD 165) 1–4681	13	2	0	0	0	0	0	2	0
Nursing management (n = 13)	6	6	1	9	0	1	3	127 (SD 151) 12–526	1	2	4	1	0	1	1	3	0
Law and ethics (n = 5)	3	2	0	4	1	0	0	66 (SD 64) 16–169	1	2	0	0	0	1	1	0	0
Nursing interventions (n = 3)	3	0	0	1	0	2	0	**	1	1	0	0	0	0	0	1	0

** One study used simulated cases (n = 2642713). The second study included 30 participants divided into three groups an the third included 125 in the test and 255 in the control group.
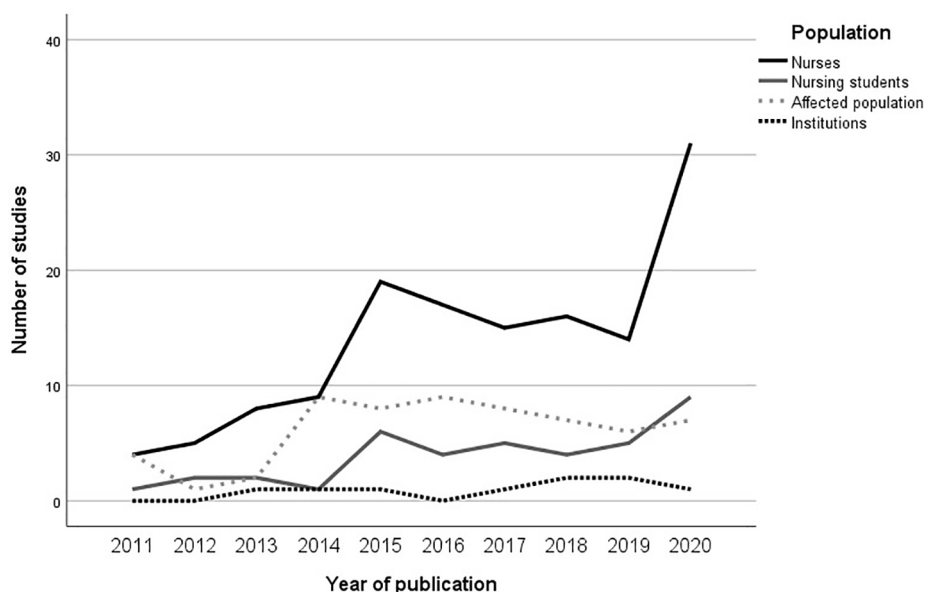
Fig. 4.

preparation and planning for deployment in disasters have been well covered by studies, while the domains of communication, incident management systems, safety and security, assessment, intervention, recovery, and law and ethics have been less covered. When reflecting on the overall research interests against the disaster management cycle [9], most studies covered the preparedness or mitigating phase, while fewer focused on the aspects of response or recovery. This large volume of preparedness, training, and competence literature is, in one way, welcomed, since a 2018 literature review concluded that nurses were ill-prepared for disaster responses [10]. However, many studies reviewed relied on vague descriptions of disaster nursing competence rather than more comprehensive knowledge of what clinical disaster nursing actually entails and what nurses require to function effectively in different disaster situations [11]. As reported by Lebrague et al. [10], many of the tools used to measure preparedness among nurses are based on self-reporting, and a variety of instruments are used, which makes it difficult to compare different forms of preparation. Given the limited studies on experiences from real-life disaster nursing, nursing management, and specific disaster nursing interventions, relevant questions are how to know what to be prepared for, how to ensure that the preparations reflect what nurses will face in a real disaster, what methods and interventions are likely to be effective, and what are the actual needs of the disaster-affected populations.

Very few studies have reported on disaster nursing interventions. Given the large number of nurses involved in disaster response, this is somewhat surprising. Previous research has suggested that there is a need for a paradigm shift in healthcare decision making in disasters, moving towards a more reliable and robust evidence base for interventions at all stages of disaster management [6,12], Therefore, greater efforts are needed to develop and evaluate effective nursing interventions, methods, and approaches to manage disasters, both from a clinical and theoretical perspective. No study was found that related to terrorist attacks or shootings, and just one reported on the health effects and victims´ experiences from a bus accident. Therefore, this review indicates the need to broaden the research focus and study settings to build a comprehensive foundation of knowledge in responding to future disasters in all areas, including nursing preparedness and clinical disaster nursing.

The lack of conformity in disaster health research, such as when to inventory and describe health effects, how to report experiences from specific events, and how to evaluate new interventions, limit the possibilities to compare and evaluate disaster health effects and response strategies [13]. Many studies in this review focused on health effects, in particular mental health effects. The median of sample sizes in studies on health effects varied between 12 and 224,116, with a median of 226 participants. Small sample sizes tend to report a higher level of mental health problems [14]. However, the median sample size found in this review was larger than in a previous review of disaster mental health studies, in which the median was 150 study participants [14].

Most studies relied on a study population of nurses or nursing students. This might be the result of the large focus on disaster preparedness among these groups, but it can also serve as a reminder of the need to increase the number of studies focused on the affected population. As in many other disciplines, the inclusion of the target population is of importance during the whole research process. Within disaster research, this might be a challenge for many reasons. However, including the affected populations and beneficiaries of nursing care in disasters would add value both clinically and theoretically. However, conducting disaster nursing studies can be challenging from both a practical and scientific perspective. Gathering personal information related to one's health, wellbeing, and experience from disaster-affected populations, including the professionals deployed in such circumstances, demands awareness and sensitivity [15,16]. When using a qualitative design, this review showed that most studies gathered data using individual interviews, and only a few used focus group interviews. Since disasters involve experiences that are traumatic or distressing among both survivors and professional responders, focus groups might be a suitable way to gather data and, at the same time, provide opportunities for social support to the study participants [17]. Moreover, because disasters might reduce the possibility of physically reaching the study participants [16] due to destroyed infrastructure or security aspects, remote data gathering methods, such as drone pictures, online surveys, digital interviews, social media, and similar methods, might be useful to enable disaster nursing research in the future. As an example, social media has been previously used to reach study participants in a natural disaster context [18,19]. As in all research, the protection of study participants' integrity and wellbeing must be a high priority, regardless of the data gathering methodology used, and the potential risks and benefits must be balanced in relation to the individual, as well as to the society as whole [20]. However, failing to conduct scientific studies on disasters due to methodological or ethical challenges might also be unethical [21].

One specific challenge that might reduce the possibility of conducting research in the very early stages of a disaster is related to the formal procedures for obtaining ethical approval [22]. Infrastructural damage, severe impacts on essential societal functions, or the loss of professionals may reduce the practical possibilities of processing such applications. Delays in processing time can also reduce the possibility of gaining the necessary permissions quickly. However, the regulations and processes around securing ethical permission vary, and it sometimes may be possible to plan for and apply for the necessary permissions beforehand [23]. In any case, researchers should prepare their studies and ethical protocols so that these can easily be adapted to different emergencies as needed [23]. If the research is being conducted in other countries or contexts where the researcher is less familiar, it is recommended to work closely with local partners from the start in order to ensure contextual awareness, such as local ethical, cultural, and practical circumstances [22]. The ongoing Covid-19 pandemic, on the other hand, is a long-lasting, worldwide situation that offers different and, to some extent, new possibilities to gain scientific knowledge on nursing in pandemics. It is possible, but not certain, that such knowledge would also be applicable in other disasters.

Since disasters strike all over the world and most often are unexpected, a scientific base that includes both the preparedness, mitigating, response, and recovery phases is essential for clinical nurses to act in accordance with best practices and provide evidence-based care. This review provides an overview of recent disaster nursing research that can offer both insight and inspiration for nurses to contribute to developing such a scientific base for disaster nursing. Additionally, it emphasises the need for further development and scientific evaluation of the strategies, interventions, and methods used in clinical disaster nursing.

5. Limitations

This review has several limitations. Since the aim of a scoping review is not to describe or synthesise the research findings [7], quality appraisal is not mandatory in such reviews [8]. Neither the actual quality of the included studies nor the levels of evidence could therefore be reported, as in a traditional systematic review. Even if not mandatory, though, quality appraisal could benefit the overall outcome and add value in scoping reviews, which could be considered in future scoping reviews in this area of inquiry. Further, the specific reference for each of the included studies is not presented under the results as this is not feasible or of interest in a scoping study that provides a descriptive account of available information [8]. Thus, selection bias may occur in scoping reviews, leading to the exclusion of available data on a topic [8]. This study included only the last 10 years of published papers from three databases, relying on the indexing of the study using "disaster nursing" as a keyword or index word. This means that several papers of interest might have been missed. Index words that could have been included are, for example, major incident, catastrophe, mass casualty incident, and other similar terms. However, the choice was made to stay with the disaster term, since that term is the one used by the ICN. The choice of search terms might also have influenced the finding that few studies addressed the lived experiences of disaster victims, if these were not indexed using the keyword "disaster", but, for example, a specific disaster event instead. The authoŕs impression was that more studies from the early years of the review were not indexed as disaster nursing studies. However, this is an undocumented indication. This review was conducted by only one researcher. However, the results were discussed with disaster nursing research colleagues, who contributed with their thoughts and conclusions. It would have been preferable to have at least two authors, but as no formal quality appraisal was made, the negative effect from using a single author was limited. In addition, since literature reviews were excluded, this scoping review does not show how reviews contribute to the evidence base of disaster nursing and in what areas systematic literature reviews are used to increase clinical nursing in disasters. These are research questions that deserve further attention.

There are many priorities for disaster nursing research in the future. To identify gaps in the evidence base within disaster nursing research, further scoping and systematic reviews are needed. Therefore, an overview of existing reviews within the field of disaster nursing would also be helpful in identifying gaps in knowledge and evidence. Since few studies describe or evaluate disaster nursing interventions and care provided to disaster victims, effective ways to promote health and wellbeing among both affected populations and the nurses themselves requires further attention. Additionally, successful nursing management strategies and methods can have great impact both on the affected population and the nurses deployed in disasters. Given the practical challenges of conducting research studies in a disaster context, such studies might have to be prepared beforehand and may require, to some extent, different methods and considerations. Strategies to increase the inclusion of disaster-affected populations within the research activities, not only as study samples but also in the planning, conducting, dissemination, and implementation phases, are desired within disaster nursing, as has been done in other fields of research.

6. Conclusion

In recent years, the number of disaster nursing science publications has increased. However, since disaster nursing consists of many domains and different phases, scientific inquiry should mirror this complexity. Therefore, there is a need to broaden the research focus and increase research studies on the response and recovery perspectives of disaster management, such as nursing management, nursing interventions, health outcomes, and ethical issues, in order to contribute to a robust scientific base of clinical disaster nursing. In addition, nurses should be encouraged to plan for disaster research studies beforehand and to consider the inclusion of the affected populations in this process to a greater extent.

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