

## REVIEW ARTICLE

# Emotional and psychological implications for healthcare professionals in disasters or mass casualties: A systematic review

Miguel Rodríguez-Arrastia RN, MSc, PhD, Lecturer<sup>1,2</sup>  |

Manuel García-Martín RN, MSc, Nurse Practitioner<sup>3,4</sup> |

Esperanza Villegas-Aguilar RN, MSc, Registered Nurse<sup>5</sup> |

Carmen Ropero-Padilla RN, MSc, PhD, Lecturer<sup>1,2</sup>  |

Luis Martín-Ibañez RN, MSc, PhD, Nurse Practitioner<sup>6</sup> |

Pablo Roman RN, MSc, PhD, Vice Dean and Lecturer<sup>3,7,8</sup> 

<sup>1</sup>Faculty of Health Sciences, Pre-Department of Nursing, Jaume I University, Castellon de la Plana, Spain

<sup>2</sup>Research Group CYS, Faculty of Health Sciences, Jaume I University, Castellon de la Plana, Spain

<sup>3</sup>Faculty of Health Sciences, Department of Nursing Science, Physiotherapy and Medicine, University of Almeria, Almeria, Spain

<sup>4</sup>IMA S0082 Group, Hospital de Poniente, Almeria, Spain

<sup>5</sup>Sant Joan de Déu de Martorell Hospital, Barcelona, Spain

<sup>6</sup>Field Artillery Group, Light Infantry Brigade "King Alfonso XIII" II of the Legion, Almeria, Spain

<sup>7</sup>Research Group CTS-451 Health Sciences, University of Almeria, Almeria, Spain

<sup>8</sup>Health Research Centre, University of Almeria, Almeria, Spain

## Correspondence

Carmen Ropero-Padilla, Faculty of Health Sciences, Pre-Department of Nursing, Jaume I University, Castello de la Plana, Av. Sos Baynat, 12071, Castellon de la Plana, Spain. Email: ropero@uji.es

## Funding information

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

## Abstract

**Aim:** To synthesize and describe the emotional and psychological implications for healthcare professionals who provided care in a mass casualty incident or disaster.

**Background:** The experience of healthcare providers immersed in the actual uncertainty of an ongoing disaster is real, challenging, complex and strongly connected with emotions. Identifying these implications for healthcare professionals is essential for developing strategies to help these professionals deliver high-quality care.

**Evaluation:** A systematic review was conducted in PubMed, CINAHL, Scopus, Nursing & Allied Health Database and PsycINFO using published data until February 2021 and following the PRISMA guidelines.

**Key issues:** Nineteen articles were included. Factors associated with negative psychological implications were identified and different strategies have been synthesized to prevent or reduce them when caring for the victims of a disaster.

**Conclusions:** Feelings of sadness, helplessness, fear and blockage, among others, were identified as common reactions among nurses and other healthcare professionals dealing in mass casualties or disasters. These reactions may lead to post-traumatic disorder, turning professionals into hidden victims.

**Implications for nursing management:** Organizations, senior charge nurses and other health service managers need to foster resilience and flexibility among their workforce to improve self-care during a disaster, as well as ensure policies to address a lack of emotional preparedness among their personnel. Some strategies to consider include cognitive behavioural therapy, psychoeducation or meditation.

## KEYWORDS

disasters, emotional distress, health personnel, mass casualty incidents, personnel management, psychological stress reaction

## 1 | INTRODUCTION

Disasters are defined as any event that causes significant harm, economic damage, loss of life and worsening of health and health services, requiring an extraordinary response from sectors outside the affected community or area in a short period of time (Below et al., 2009; Kearns et al., 2017). Their distribution is widespread in many countries, and their frequency has increased over time, both in terms of the number of phenomena that have occurred and the number of people who have been affected. As a direct consequence, there has been an increasing trend in public health issues, as well as an increase in the number of communities affected as a result of the physical and economic losses (Bazyar et al., 2019; Spruce, 2019).

Disasters can be categorized as natural and human-made disasters, depending on their nature and type of disaster (Coccolini et al., 2020; World Health Organization, 2007). The term mass casualty incident (MCI) relates to this, which includes the mobilization of extraordinary resources when local emergency systems are overwhelmed and unable to manage the situation in the first 15 min. In this manner, the difference from a disaster is where it happens and the number of people affected or in other words, the availability of services (Khajehaminian et al., 2018; Tari-Verdi et al., 2018; Yafe et al., 2019). In this context, nurses and other first responders are responsible for caring for those suffering in times of crisis, pain and grief, both for victims and their families, and are therefore susceptible to emotional and psychological distress (Hunnicut-Ferguson et al., 2018; Labrague et al., 2018; Morgan, 2016). Certainly, the impact of disasters on the general population and on the psychological problems of victims has received a lot of research attention (Kang, 2020; Resnick et al., 2020; Thoresen et al., 2019; Yoo et al., 2019).

However, little research has been done on those who are directly involved in the rescue, frequently turning these healthcare professionals into hidden victims of these disasters (Kearns et al., 2017). This is highly important in the current pandemic situation, where the emergence of COVID-19 has raised a worldwide community health challenge and these professionals have become more important than ever (Coccolini et al., 2020; Foley et al., 2020). In view of the increased incidence of traumatic events at international level, organizations must therefore consider protecting professionals physically and emotionally in order to ensure that they are able to provide optimal and sustained care (King et al., 2016; Macpherson & Burkle, 2020; Yip et al., 2016). There is an urgent need for organizations and managers to plan disaster preparedness and appropriate programmes for nurses and healthcare workers to be capable of overcoming the risks associated with these events (Ghazi-Baker et al., 2019).

## 2 | AIMS

The aim of this study was to synthesize and describe the emotional and psychological implications for healthcare professionals who provided

care in an MCI or disaster, as well as to summarize different strategies to protect and/or recover the mental health of these professionals.

## 3 | METHODS

### 3.1 | Design

A systematic review of studies published up to February 2021 was conducted in accordance with the Cochrane Collaboration methodology and the PRISMA guidelines (Supporting Information S1) (Higgins & Green, 2011; Moher et al., 2009). A Patient-Intervention-Outcome (PIO) strategy was used to structure the research question (Stone, 2002): “In healthcare professionals (P), what strategies are used (I) to mitigate the psychological and emotional impact in a disaster or MCI (O)?.” The protocol for this review was not registered.

### 3.2 | Search strategy

The electronic databases PubMed, CINAHL, Scopus, Nursing & Allied Health Database, and PsycINFO were consulted, using natural and structured language. This search strategy was adapted for use across databases (see Table S1).

### 3.3 | Selection criteria

The following inclusion criteria were used: (i) articles published in English or Spanish, (ii) articles published up to February 2021, (iii) original research, (iv) papers focused on emotional and psychological implications, skills or attitudes among nurses or healthcare professionals involved in disasters or MCIs and (v) research on the promotion of useful attitudes in disaster assistance. Likewise, the exclusion criteria included (i) studies on victims of MCI or disasters, (ii) studies with students, (iii) simulation-based training studies and (iv) review papers.

### 3.4 | Data screening

Data screening was performed in three phases, by title, abstract and full text. The eligibility process was done by two authors independently and in duplicate, if consensus could not be achieved, a third author was consulted. From all the manuscripts included, a bibliometric analysis was performed about the following variables: (i) study design, (ii) type of disaster, (iii) participants and (iv) main findings or results.

### 3.5 | Quality appraisal

All manuscripts included were critically read, and the quality of selected articles was independently assessed by two researchers,

with a third researcher consulted to reach a consensus in case of disagreement. According to Critical Appraisal Skills Programme (CASP) or National Institutes of Health Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (NIH-QAT) checklists, appropriate criteria were used for each study, based on the research design used in each one (CASP, 2019; National Institutes of Health, 2017). In this sense, this assessment included both qualitative studies ( $n = 7$ ), cohort studies ( $n = 5$ ), and cross-sectional studies ( $n = 7$ ). No articles were excluded after quality appraisal.

The average quality of the evaluated studies was 9.57 over 10 on the CASP checklist (Figure 1), whereas it was 7.25 over 14 for the NIH-QAT-evaluated studies (Figure 2). The quality of their reporting varied from 7 to 10 on the CASP checklist and from 3 to 10 on the NIH-QAT checklist. None of them reported an inappropriate reporting quality (lower than 3 on CASP checklist and lower than “fair” on NIH-QAT checklist).

### 3.6 | Data abstraction and synthesis

Data from the included studies was extracted and tabulated according to (i) author(s), (ii) country, (iii) study design, (iv) type of disaster, (v) participants and (vi) main findings (Table 1). Finally, descriptive and narrative analyses were used to synthesize the extracted data, according to the research question.

## 4 | RESULTS

### 4.1 | Characteristics of selected papers

In the first stage, databases yielded 462 articles (CINAHL ( $n = 25$ ), Nursing & Allied Health Database ( $n = 143$ ), PsycINFO ( $n = 32$ ) and PubMed ( $n = 262$ )), 29 of which were discarded due to duplicity. Following title, abstract, and full-text screening, 414 papers were excluded based on the selection criteria. Finally, 19 studies were included in this review (Figure 3).

All included articles are displayed in Table 1. Twelve (63.16%) of these articles were quantitative studies, among which 5 were cohort studies, and 7 used a cross-sectional design. Seven studies (36.84%), on the other hand, used qualitative designs, 4 of which (21.05%) used an inductive approach, 2 (10.53%) used a phenomenological design and 1 (5.26%) used a grounded theory design. Overall, 2 (10.53%) articles included all types of disasters in their studies, while 8 (42.11%) focused their study on natural disasters and 9 (47.37%) on human-made disasters. All included studies were published between 1985 and 2020, with the majority of them conducted in America ( $n = 7$ ) and Europe ( $n = 6$ ), but also in Asia ( $n = 5$ ) and Oceania ( $n = 1$ ). Likewise, the sample size in each study ranged from 7 to 16,488 participants. The age of these participants ranged from 21 to 60 (with a mean age of 39.77 years), enrolling a total of 21,853 participants (16,339 men and 4728 women).

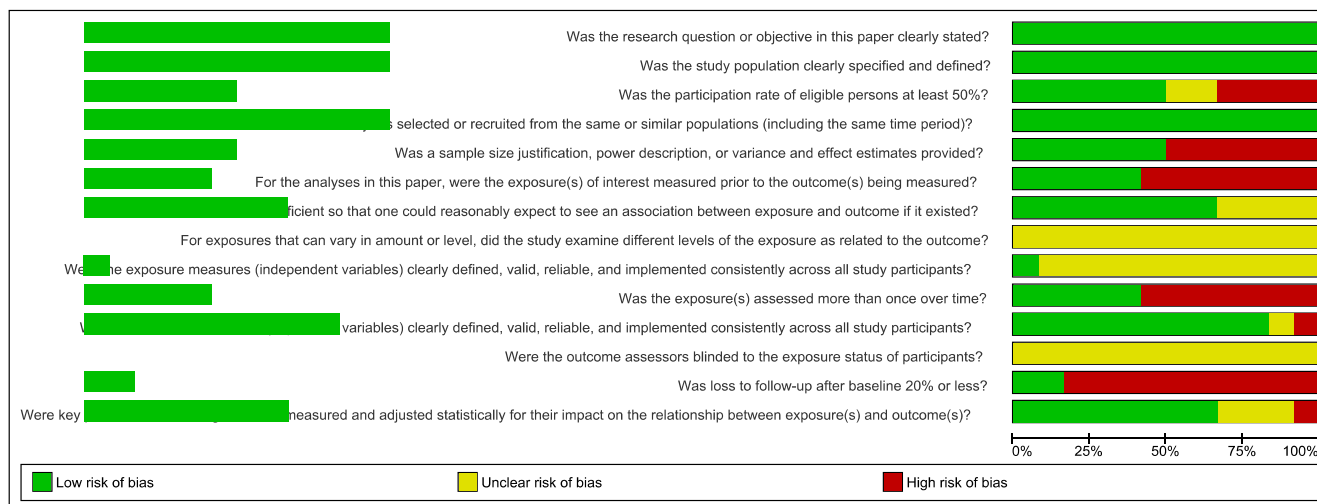
	Was there a clear statement of the aims of the research?	Is a qualitative methodology appropriate?	Was the research design appropriate to address the aims of the research?	Was the recruitment strategy appropriate to the aims of the research?	Was the data collected in a way that addressed the research issue?	Has the relationship between researcher and participants been adequately considered?	Have ethical issues been taken into consideration?	Was the data analysis sufficiently rigorous?	Is there a clear statement of findings?	How valuable is the research?
Brooks et al. 2019	+	+	+	+	+	+	+	+	+	+
Dolan & Tedeschi 2018	+	+	+	+	+	+	+	+	+	+
Fardousi et al. 2019	+	+	+	+	+	+	+	+	+	+
Hugelius et al. 2017	+	+	+	+	+	+	+	+	+	+
Pourvakhshoori et al. 2017	+	+	+	+	+	+	+	+	+	+
Smith et al. 2020	+	+	+	+	+	+	+	+	+	+
Zinsli & Smythe 2009	+	+	+	+	+	-	+	+	-	-

FIGURE 1 Critical Appraisal Skills Programme (CASP) checklist quality appraisal summary

The data synthesis revealed five categories related to emotional and psychological implications and their prevention for healthcare professionals who provide care in an MCI or disaster. In this manner, these implications would be associated with pre-disaster, disaster and post-disaster factor, as well as common consequences for the disaster as a whole and possible strategies for their prevention. These categories are described below.

### 4.2 | Pre-disaster factors

Pre-disaster events include personal factors, that is, significant pre-disaster life events such as personal trauma and medical history, which showed a relation with the risk of mental health issues following a disaster (Hugelius et al., 2017; Morren et al., 2007). In the same way family concern became an important factor, particularly in cases of pandemic, where professionals are afraid of infecting their family and loved ones; and even if the partner both works in an emergency service, it causes great stress due to the likelihood that they could be injured, missing or dead in the event of a disaster (Fardousi et al., 2019; Verschuur et al., 2007; Waters et al., 1992). Similarly, the



**FIGURE 2** National Institutes of Health Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (NIH-QAT) checklist quality appraisal graph

feeling of lack of training or previous experience appears to be associated with increased stress (Dolan & Tedeschi, 2018; Pourvakhshoori et al., 2017). However, according to Brooks et al., 2019, no significant differences were observed between those involved in previous disasters and those who have not, including their previous experience as a protective factor.

### 4.3 | Factors during a disaster

Disaster factors include organizational factors and the magnitude of the disaster itself. The type of event constitutes a potential barrier for healthcare providers to work with during a disaster, as exposition is greater when a conventional event (natural hazards such as an earthquake or a traffic incident) than when a non-conventional event occurs (pandemics and radiological events) (Maslow et al., 2015; Waters et al., 1992). Thus, dependent factors on the disaster that occurred, such as the magnitude and suddenness of the effects (De Soir et al., 2012), proximity to the epicentre and early arrival at the site where it occurred, were established as significant factors that had a detrimental impact on the psychological well-being of the professionals responsible for assisting the victims (Brooks et al., 2019; Rogers & Lawhorn, 2007).

In regards to the factors listed above, healthcare professionals reported that the nature and severity of the injuries and distress had a significant impact on their lives (De Soir et al., 2012; Maslow et al., 2015), increasing the risk of post-traumatic stress disorder (PTSD) (Caramello et al., 2019; De Soir et al., 2012; Thompson, 1993). Likewise, talking to victims' families is one of the most stressful factors identified by professionals themselves (De Soir et al., 2012; Waters et al., 1992), and even emotional involvement could lead to an over-identification and secondary

trauma (Brooks et al., 2019; De Soir et al., 2012; Durham et al., 1985). In this way, long periods of time at the disaster site have been shown to be associated with negative psychological effects, such as increased levels of mental distress, depression and PTSD (Morren et al., 2007; Pourvakhshoori et al., 2017). In the same context, life-threatening factors were correlated to anxiety, depression, general psychiatric symptoms, and PTSD (Chan et al., 2016; De Soir et al., 2012; Nishi et al., 2012; Verschuur et al., 2007), as well as vulnerability, notably when these professionals were injured or had near-death experience which had a detrimental impact on their well-being (Chan et al., 2016; De Soir et al., 2012; Durham et al., 1985).

At the organizational level, two causes of stress have been identified. First, undefined responsibilities and second, clinical practice outside the usual service (Durham et al., 1985). A number of illnesses have been associated with these causes, including increased anxiety, secondary trauma and burnout. In this sense, workload and a lack of resources undermine vulnerability indirectly (Caramello et al., 2019; Morren et al., 2007). However, these risks do not have the same implications on all healthcare professionals, particularly increased among personnel with chronic health conditions, pregnant women, or those who perceive that their work environment is unsafe (Maslow et al., 2015). Likewise, the lack of leadership was described as stressful (Pourvakhshoori et al., 2017), and so was the perceived lack of support within the team and the lack of social support (Brooks et al., 2019; Dolan & Tedeschi, 2018).

### 4.4 | Post-disaster factors

Exposure to major post-disaster events such as divorce, relationship breakups, disaster reports in mass media, loss of properties,

TABLE 1 Synthesis of the articles included in the integrative review

Reference	Country	Study design	Type of disaster	Participants	Main findings	Scale/score
Smith et al. (2020)	USA	Qualitative; inductive approach	Terrorist attack	26 hospital-based responders	Although most responders felt prepared, there was a lack of non-traditional communication channels and management of volunteer assistance. Plans for post-event debriefings emerged as a priority in order to recognize the personal impact on providers	CASP qualitative 10/10
Brooks et al. (2019)	UK	Qualitative; inductive approach	All types of disasters	15 healthcare professionals 10 emergency service providers	Participants were reluctant to seek professional help because mental health issues could lead to them being perceived as weak and potentially adversely affecting their careers. Institutions should implement education programmes to reduce the stigma associated with mental health in these situations	CASP qualitative 10/10
Caramello et al. (2019)	Italy	Quantitative; cohort study	Mass panic	49 healthcare professionals	The high demand for ED services caused by a large influx of patients may be related to cumulative stressors and predict fatigue-like symptom. Participants advocate for pre-event training and monitoring of mental health risks in order to mitigate negative outcomes	STROBE 18/22
Fardousi et al. (2019)	Syria	Qualitative; inductive approach	Besieged health facilities	21 health-workers	Lessons for besieged planning included emergency response training for health-care workers and service managers, facility security, and the development of emotional coping skills	CASP qualitative 10/10
Dolan and Tedeschi (2018)	USA	Qualitative; grounded theory	Avalanche	13 first responders	There is a scarcity of psychological training and post-event support from organizations. Participants perceived themselves to be underqualified, and their jobs associated with significant psychiatric morbidity	CASP qualitative 10/10
Hugelius et al. (2017)	Philippines	Qualitative; phenomenological study	Typhoon	8 health professionals	Being a first responder and survivor in a disaster is a complex and ambiguous experience. To be prepared in such situations, disaster medicine training must take into account the specific needs of health professionals	CASP qualitative 10/10
Pourvakhshoori et al. (2017)	Iran	Qualitative; inductive approach	Natural disasters	15 nurses	Disaster training and preparation are critical to preventing emotional and psychological trauma. A better understanding of moral implications lessens the sense of futility	CASP qualitative 10/10

(Continues)

TABLE 1 (Continued)

Reference	Country	Study design	Type of disaster	Participants	Main findings	Scale/score
Chan et al. (2016)	Philippines	Quantitative; cross-sectional study	Typhoon	237 disaster-relief responders	Post-disaster mental health training is needed to help them cope with acute and long-term DRS	STROBE19/22
Maslow et al. (2015)	USA	Quantitative; cohort study	Terrorist attack	16,488 recovery workers	Planning and preparation for post-disaster mental health needs should take into account divergent PTSD courses based on individual and contextual circumstances, as well as periodic screening	STROBE19/22
De Soir et al. (2012)	Belgium	Quantitative; cohort study	Gas explosion	79 emergency medical personnel	Emergency medical personnel received less specific training and must understand the potential psychological consequences of confronting potentially traumatizing events. These professionals experienced helplessness, terror, fear, a sense of apocalypse and pain	STROBE16/22
Nishi et al. (2012)	Japan	Quantitative; cohort study	Earthquake	254 DMATs	Factors related to peritraumatic emotional distress, such as losing control of emotions or feeling ashamed of emotional reactions, appear to be important in screening medical rescue workers.	STROBE19/22
Zinsli and Smythe (2009)	New Zealand	Qualitative; phenomenological study	All types of disasters	7 nurses	The human-to-human call and response to need is what keeps nurses involved in life-changing and life-claiming experiences like humanitarian aid, despite the fact that it implies personal danger	CASPqualitative7/10
Mackler et al. (2007)	USA	Quantitative; cross-section study	Virus exposure	95 first responders	Hospitals and local governments should consider stockpiling PPE and prioritizing first-responder training	STROBE12/22
Morren et al. (2007)	Netherlands	Quantitative; cohort study	Fireworks explosion	3,053 rescue workers	Rescue workers do not appear to be immune to the consequences of disasters, despite their experience and training. Healthcare providers should be aware that disaster-related health issues may not manifest themselves for several years after the disaster	STROBE20/22
Rogers and Lawhorn (2007)	USA	Quantitative; cross-sectional study	Hurricane	725 healthcare professionals	Disaster management is critical in order to reduce risk and manage potential injuries and illnesses. Occupation health nurses may serve as liaisons between agencies and organizations	STROBE9/22

(Continues)



TABLE 1 (Continued)

Reference	Country	Study design	Type of disaster	Participants	Main findings	Scale/score
Verschuur et al. (2007)	Netherlands	Quantitative; cross-sectional study	Aviation disaster	667 rescue workers	High levels of psychopathology and fatigue, as well as increased anxiety and uncertainty about health conditions, were reported 6 weeks after the results	STROBE20/22
Thompson (1993)	UK	Quantitative; cross-sectional study	Aviation disaster	40 first responders	Work-related stress, the emotional and physical demands of being on call, and a complicated relationship between professionals and management are all major disaster-related factors	STROBE9/22
Waters et al. (1992)	USA	Quantitative; cross-sectional study	Hurricane	25 nurses	Hospital policy should be integrated to ensure that nurses' performance and personal mental health are not compromised	STROBE11/22
Durham et al. (1985)	USA	Quantitative; cross-sectional study	Apartment building explosion	26 hospital-based professionals	Coping styles reflect an attempt to gain control of the situation, to mentally prepare, and to comprehend the gravity of the tragedy	STROBE11/22

Note: ED: Emergency department; DRS: Disaster-related stressors; DMAT: Disaster medical assistance teams; PTSD: Post-traumatic syndrome disorder; PPE: Personal protective equipment.

significant changes in jobs, and financial strains had negative psychological implications for professionals (Chan et al., 2016; Nishi et al., 2012; Smith et al., 2020). Besides this, the lack of recognition, according to the model of balance effort-reward, creates a split in the reciprocal relationship between effort (required to meet labour demands) and rewards (in terms of salary, esteem, professional opportunities or feeling valued) (Brooks et al., 2019).

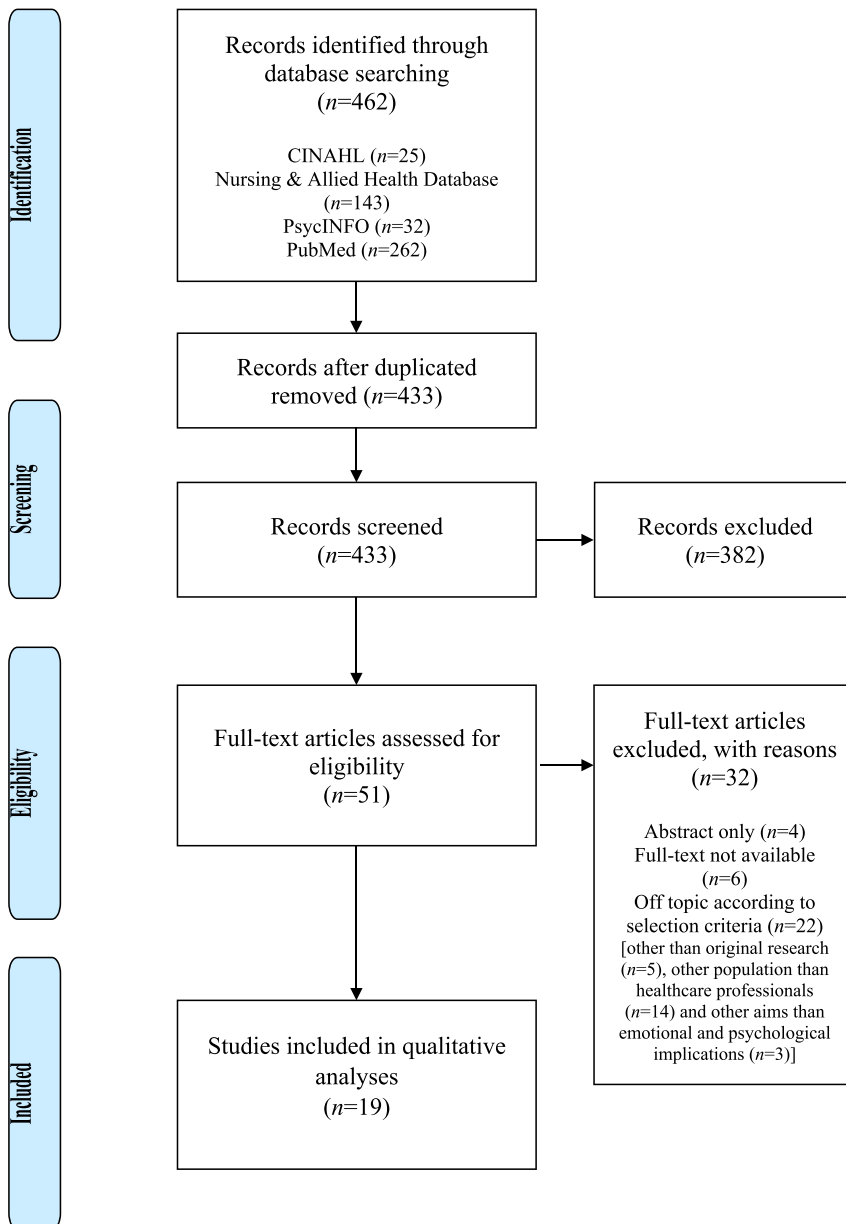
#### 4.5 | Strategies to prevent psychological implications

The value of high-quality training to deal with challenging circumstances and to know how to work under pressure and uncertainty is absolutely crucial (Caramello et al., 2019; Dolan & Tedeschi, 2018; Hugelius et al., 2017). This training requires, therefore the knowledge of how to protect themselves and their families, the precautions they should take, as well as the knowledge of how to manage the safety equipment needed to reduce perceived risks (Mackler et al., 2007; Verschuur et al., 2007). It also involves training in skills, expertise and confidence to work under high-stress situations (Smith et al., 2020; Waters et al., 1992), seminars or training days on emotional/psychological well-being, stress management and relaxation strategies training, psychological first aid training, strategies to build resilience (Chan et al., 2016), as well as emotional and cognitive readiness for the realities they may face professionally (Nishi et al., 2012; Rogers & Lawhorn, 2007).

## 5 | DISCUSSION

This study was aimed to synthesize and describe the emotional and psychological implications for nurses and other healthcare professionals who provided care in an MCI or disaster, as well as to summarize different strategies to protect and/or recover the mental health of these professionals. In this sense, this systematic review from 19 studies showed both emotional and psychological implications for these professionals, as well as possible prevention and workforce management strategies.

A range of emotions complement one another in healthcare professionals following an MCI, from feelings of grief and helplessness to fear and frustration. These feelings can be the product of stress and heavy workloads, which can lead to frustration and feelings of remorse for not being able to save everyone (Hugelius et al., 2017; Nishi et al., 2012). In line with other studies on victims (Kang, 2020; Resnick et al., 2020; Thoresen et al., 2019), the emotions and problems most commonly reported in the analyzed studies were identified as physical and emotional issues. The described physical problems in healthcare professionals included fatigue and exhaustion (Pourvakhshoori et al., 2017; Verschuur et al., 2007). In terms of emotional problems, anxiety, sadness, restlessness, sleep problems and nightmares, stress and depression were all identified (Brooks



**FIGURE 3** Flowchart depicting the article selection process

et al., 2019; Caramello et al., 2019; De Soir et al., 2012; Dolan & Tedeschi, 2018; Pourvakhshoori et al., 2017; Verschuur et al., 2007; Waters et al., 1992; Zinsli & Smythe, 2009). Other identified emotions included fear, confusion, helplessness, rage, terror, hate, resentment, panic, intrusive thinking, irritability or difficulty in social interactions (De Soir et al., 2012; Hugelius et al., 2017; Nishi et al., 2012; Pourvakhshoori et al., 2017; Verschuur et al., 2007; Waters et al., 1992).

Clinical practice during a disaster or an MCI may cause professionals to suppress their emotions and work on what is known as an autopilot to overcome their fears (De Soir et al., 2012), describing emotion-freeness and working professionally in an automatic manner. However, this may lead to delayed emotional grief, which is common among healthcare professionals, due to the high burden of care and the high psychological implications, with the likelihood of having

suffered losses on their own (Hugelius et al., 2017; Nishi et al., 2012). Professionals postpone any awareness or expression of psychological distress in order to achieve success, and then, over time, exhibit atypical behaviours that they have not been able to regulate, such as irritability, impatience, and communication difficulties (Rogers & Lawhorn, 2007; Waters et al., 1992).

Conversely, some professionals also reported positive emotions, such as having felt commitment, professional satisfaction and pride in what they have done and their role in providing assistance (Brooks et al., 2019; Pourvakhshoori et al., 2017; Smith et al., 2020). The sense of pride can be strengthened by the support and gratitude of the community as well as other professionals, validating the work they do and restoring commitment to their profession (De Soir et al., 2012), as seen during the COVID-19 pandemic (Foley et al., 2020; Salopek-Žiha et al., 2020). Moreover, resisting



the stress of disasters provides opportunities for meaningful personal growth and professional development, contributing to the development of post-traumatic recovery (Brooks et al., 2019; Hugelius et al., 2017).

Having said that, PTSD is one of the most common issues or disorders (Chan et al., 2016; Dolan & Tedeschi, 2018; Maslow et al., 2015; Nishi et al., 2012). Most studies point to psychological disorders shortly following an incident that decreases over time. However, others indicate that these problems persist after a significant period of time (Durham et al., 1985; Morren et al., 2007; Waters et al., 1992). It is important to highlight that certain professionals suffer from PTSD below the threshold, suffering other types of psychological distress as a result of exposure to a disaster, and that while they do not require the same care as PTSD, they should not be overlooked (Brooks et al., 2019; Chan et al., 2016; Maslow et al., 2015). Therefore, efficient staff training becomes a primary resource as a protective measure. In this context, simulation provides the opportunity to integrate the expertise, knowledge and cohesion of the team to tackle unpredicted incidents (Carenzo et al., 2018; Jonson et al., 2017), and it has also been shown to be effective in identifying and treating victims in crisis situations, highlighting physical severity and psychological risks (Fardousi et al., 2019; Morren et al., 2007).

In addition to training, the development of disaster and emergency plans, and leadership in these circumstances becomes critical, providing clear guidance, appropriate input and support to the team, as well as preparing staff for lack of control (Coccolini et al., 2020; Hugelius et al., 2017; Rogers & Lawhorn, 2007; Yafe et al., 2019). It is also important to provide an organizational model for shared decisions and consensus (Hugelius et al., 2017; Rogers & Lawhorn, 2007), encouraging a culture of inclusion, equality and equity, flexible working conditions and management style that includes an open communication style and daily input (Brooks et al., 2019; Pourvakhshoori et al., 2017).

Notwithstanding previous training, leadership and organizational measures, institutions must consider the psychological impacts for nurses and other healthcare professionals and ensure that appropriate resources are available to vulnerable groups (King et al., 2016; Maslow et al., 2015; Pourvakhshoori et al., 2017). Professional psychological support is the most enlightened resource, through access, frequent mental health assessments and the follow-up of vulnerable professionals (Dolan & Tedeschi, 2018; Rogers & Lawhorn, 2007). For all these reasons, it is essential to emphasize to professionals the differences between strange and unfamiliar reactions (Maslow et al., 2015), and to cope with acute and long-term sources of stress (Chan et al., 2016).

Interestingly, and in accordance to other findings on the general population (Yoo et al., 2019), Svetlitzky et al. (2019) recently established the relevance of psychological first aid in the context of an MCI or disaster in order to cope with potential circumstances of emotional blockage that might be experienced by professionals. Psychological first aid is an intervention of support between peers (Farchi et al., 2018), the purpose of which is the rapid recovery of the

interveners so that they can remain in active service, minimizing the risks resulting from situations of blockade and at the same time, reducing the likelihood of developing psychological disorders later on (Martín-Ibáñez et al., 2019).

## 5.1 | Limitations

The main limitation in this systematic review concerned the heterogeneity of methods and participants within selected studies, which made it difficult to discuss our findings. While it is true that certain professionals such as nurses play a significant role in the response of MCI or disasters (Labrague et al., 2018), the scarcity of literature on the emotional and psychological implications among these professionals led us to explore a broader population in order to gain a better understanding of the topic. Moreover, most studies aimed to study PTSD, which may have overlooked other emotional and psychological needs of these professionals.

## 6 | IMPLICATIONS FOR NURSING MANAGEMENT

Disasters are uncontrollable, and the frequency with which they occur makes it an important factor for organizations to consider. Health care during an MCI or disaster has emotional and psychological implications for nurses and other healthcare professionals, and it is therefore indispensable that resources and strategies aimed at mitigating these implications be made available to them. This review not only illustrates the importance of these strategies among professionals in managing any emotional or psychological implications, but also in reinforcing positive emotions in their commitment to their profession. Mindfulness, gratitude, self-care, and social support are some strategies that health institutions, senior charge nurses, and other health service managers should consider in order to build these positive emotions or resilience. Considering the frequency and unpredictability of disasters, it is therefore necessary to promote training of skillset to respond and better manage disasters. However, further research is needed to understand the efficacy of these strategies and the need for others to fulfil any overlooked needs, as well as prevention protocols for organizations to follow in these scenarios.

## 7 | CONCLUSIONS

Feelings of sadness and helplessness, through fear, anger or even blockage were identified as common reactions among nurses and other healthcare professionals dealing in disasters or MCIs. As a result, if these reactions persist, they may lead in PTSD, frequently turning professionals into overlooked victims of these disasters. Organizations should focus their strategies to prevent negative emotional and psychological implications on mitigating the identified risk factors, providing support to nurses and other first responders trained in

psychological first aid and psychologists, and encouraging advanced training for emergency and disaster professionals. Health service managers need to foster resilience and flexibility among their workforce to improve self-care during a disaster, as well as ensure policies to address a lack of emotional preparedness among their personnel. In this vein, some strategies to consider include cognitive behavioural therapy, psychoeducation or meditation.

## CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

## ETHICS STATEMENT

Ethical approval was not required as this is a systematic review.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in repository.

## ORCID

Miguel Rodriguez-Arrastia  <https://orcid.org/0000-0001-9430-4272>

Carmen Ropero-Padilla  <https://orcid.org/0000-0001-5883-767X>

Pablo Roman  <https://orcid.org/0000-0002-5966-0498>

## REFERENCES

- Bazyar, J., Farrokhi, M., & Khankeh, H. (2019). Triage Systems in Mass Casualty Incidents and Disasters: A review study with A worldwide approach. *Open Access Macedonian Journal of Medical Sciences*, 7(3), 482–494. <https://doi.org/10.3889/oamjms.2019.119>
- Below, R., Wirtz, A., & Guha-Sapir, D. (2009). *Disaster category classification and peril terminology for operational purposes*. Centre for Research on the Epidemiology of Disasters (CRED). [https://www.cred.be/downloadFile.php?file=sites/default/files/DisCatClass\\_264.pdf](https://www.cred.be/downloadFile.php?file=sites/default/files/DisCatClass_264.pdf)
- Brooks, S. K., Dunn, R., Amlôt, R., Rubin, G. J., & Greenberg, N. (2019). Protecting the psychological wellbeing of staff exposed to disaster or emergency at work: A qualitative study. *BMC Psychology*, 7(1), 78. <https://doi.org/10.1186/s40359-019-0360-6>
- Caramello, V., Bertuzzi, L., Ricceri, F., Albert, U., Maina, G., Boccuzzi, A., Della Corte, F., & Schreiber, M. C. (2019). The mass casualty incident in Turin, 2017: A case study of disaster Responders' mental health in an Italian level I hospital. *Disaster Medicine and Public Health Preparedness*, 13(5–6), 880–888. <https://doi.org/10.1017/dmp.2019.2>
- Carenzo, L., Ragozzino, F., Colombo, D., Barra, F. L., Della Corte, F., & Ingrassia, P. L. (2018). Virtual laboratory and imaging: An online simulation tool to enhance hospital disaster preparedness training experience. *European Journal of Emergency Medicine*, 25(2), 128–133. <https://doi.org/10.1097/MEJ.0000000000000421>
- CASP. (2019). *CASP-critical appraisal skills Programme*. CASP-Critical Appraisal Skills Programme Website. <https://casp-uk.net/>
- Chan, C. S., Tang, K. N. S., Hall, B. J., Yip, S. Y. T., & Maggay, M. (2016). Psychological Sequelae of the 2013 super typhoon Haiyan among survivor-responders. *Psychiatry*, 79(3), 282–296. <https://doi.org/10.1080/00332747.2015.1129874>
- Coccolini, F., Sartelli, M., Kluger, Y., Pikoulis, E., Karamagioli, E., Moore, E. E., Biffi, W. L., Peitzman, A., Hecker, A., Chirica, M., Damaskos, D., Ordonez, C., Vega, F., Fraga, G. P., Chiarugi, M., Di Saverio, S., Kirkpatrick, A. W., Abu-Zidan, F., Mefire, A. C., ... Catena, F. (2020). COVID-19 the showdown for mass casualty preparedness and management: The Cassandra syndrome. *World Journal of Emergency Surgery*, 15(1), 26. <https://doi.org/10.1186/s13017-020-00304-5>
- De Soir, E., Knarren, M., Zech, E., Mylle, J., Kleber, R., & Van der Hart, O. (2012). A phenomenological analysis of disaster-related experiences in fire and emergency medical services personnel. *Prehospital and Disaster Medicine*, 27, 115–122. <https://doi.org/10.1017/S1049023X12000507>
- Dolan, N., & Tedeschi, C. (2018). A qualitative study of psychological outcomes in avalanche first responders. *High Altitude Medicine & Biology*, 19(4), 344–355. <https://doi.org/10.1089/ham.2018.0038>
- Durham, T. W., McCammon, S. L., & Allison, E. J. (1985). The psychological impact of disaster on rescue personnel. *Annals of Emergency Medicine*, 14(7), 664–668. [https://doi.org/10.1016/S0196-0644\(85\)80884-2](https://doi.org/10.1016/S0196-0644(85)80884-2)
- Farchi, M., Hirsch-Gornemann, B. M., Whiteson, A., & Gidron, Y. (2018). The SIX Cs model for immediate cognitive psychological first aid: From helplessness to active efficient coping. *International Journal of Emergency Mental Health and Human Resilience*, 20(2). <https://doi.org/10.4172/1522-4821.1000395>
- Fardousi, N., Douedari, Y., & Howard, N. (2019). Healthcare under siege: A qualitative study of health-worker responses to targeting and besiegement in Syria. *BMJ Open*, 9(9), e029651. <https://doi.org/10.1136/bmjopen-2019-029651>
- Foley, D. A., Chew, R., Raby, E., Tong, S. Y. C., Davis, J. S., & Australasian Society for Infectious Diseases Clinical Research Network. (2020). COVID-19 in the pre-pandemic period: A survey of the time commitment and perceptions of infectious diseases physicians in Australia and New Zealand. *Internal Medicine Journal*, 50(8), 924–930. <https://doi.org/10.1111/imj.14941>
- Ghazi-Baker, O., Ateq-Alamri, A., & Aboshaiqah, A. E. (2019). A descriptive study to analyse the disaster preparedness among Saudi nurses through self-regulation survey. *Journal of Nursing Management*, 27(7), 1479–1484. <https://doi.org/10.1111/jonm.12833>
- Higgins, J.P.T., & Green, S. (2011). *Cochrane handbook for systematic reviews of interventions*. The Cochrane Collaboration. <http://handbook-5-1.cochrane.org/>
- Hugelius, K., Adolfsson, A., Örtengwall, P., & Gifford, M. (2017). Being both helpers and victims: Health Professionals' experiences of working during a natural disaster. *Prehospital and Disaster Medicine*, 32(2), 117–123. <https://doi.org/10.1017/S1049023X16001412>
- Hunnicut-Ferguson, K., Wyka, K. E., Peskin, M., Cukor, J., Olden, M., & Difiede, J. (2018). Posttraumatic stress disorder, functional impairment, and subjective distress in world trade center disaster workers. *Journal of Traumatic Stress*, 31(2), 234–243. <https://doi.org/10.1002/jts.22268>
- Jonson, C. O., Pettersson, J., Rybing, J., Nilsson, H., & Prytz, E. (2017). Short simulation exercises to improve emergency department nurses' self-efficacy for initial disaster management: Controlled before and after study. *Nurse Education Today*, 55, 20–25. <https://doi.org/10.1016/j.nedt.2017.04.020>
- Kang, E. (2020). Association between psychological morbidities and information provision, reliability, and satisfaction among disaster victims: A cross-sectional study. *Journal of Psychiatric Research*, 130, 273–279. <https://doi.org/10.1016/j.jpsychires.2020.08.010>
- Kearns, R. D., Marcozzi, D. E., Barry, N., Rubinson, L., Hultman, C. S., & Rich, P. B. (2017). Disaster preparedness and response for the burn mass casualty incident in the twenty-first century. *Clinics in Plastic Surgery*, 44(3), 441–449. <https://doi.org/10.1016/j.cps.2017.02.004>
- Khajehaminian, M. R., Ardalan, A., Keshtkar, A., Hosseini Boroujeni, S. M., Nejati, A., & Foroushani, A. (2018). A systematic literature review of criteria and models for casualty distribution in trauma related mass casualty incidents. *Injury*, 49(11), 1959–1968. <https://doi.org/10.1016/j.injury.2018.09.005>
- King, R. V., Larkin, G. L., Fowler, R. L., Downs, D. L., & North, C. S. (2016). Characteristics of effective disaster responders and leaders: A survey

- of disaster medical practitioners. *Disaster Medicine and Public Health Preparedness*, 10(5), 720–723. <https://doi.org/10.1017/dmp.2016.24>
- Labrague, L. J., Hammad, K., Gloe, D. S., McEnroe-Petitte, D. M., Fronda, D. C., Obeidat, A. A., Leocadio, M. C., Cayaban, A. R., & Mirafuentes, E. C. (2018). Disaster preparedness among nurses: A systematic review of literature. *International Nursing Review*, 65(1), 41–53. <https://doi.org/10.1111/inr.12369>
- Mackler, N., Wilkerson, W., & Cinti, S. (2007). Will first-responders show up for work during a pandemic? Lessons from a smallpox vaccination survey of paramedics. *Disaster Management and Response*, 5(2), 45–48. <https://doi.org/10.1016/j.dmr.2007.02.002>
- Macpherson, R. I. S., & Burkle, F. M. (2020). Humanitarian aid workers: The forgotten first responders. *Prehospital and Disaster Medicine*, 36, 1–4. <https://doi.org/10.1017/S1049023X20001326>
- Martín-Ibáñez, L., Pérez-Martínez, J., Zamora-Mínguez, D., Alcón-Rubio, F., González-Alonso, V., Aroca García-Rubio, S., Hernández-Hernández, J. M., Díaz, F., & Román-López, P. (2019). Consenso Victoria I: la cadena de supervivencia táctica civil ante incidentes de múltiples víctimas intencionados. *Emergencias*, 31(3), 195–201.
- Maslow, C. B., Caramanica, K., Welch, A. E., Stellman, S. D., Crackbill, R. M., & Farfel, M. R. (2015). Trajectories of scores on a screening instrument for PTSD among world trade center rescue, recovery, and clean-up workers. *Journal of Traumatic Stress*, 28(3), 198–205. <https://doi.org/10.1002/jts.22011>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Altman, D. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA Statement. *PLoS Medicine*, 6(7), e1000097. <https://doi.org/10.1371/journal.pmed.1000097>
- Morgan, P. M. (2016). The psychological impact of mass casualty incidents on first responders: A systematic review. *Journal of Emergency Management*, 14(3), 213–226. <https://doi.org/10.5055/jem.2016.0287>
- Morren, M., Dirkzwager, A. J. E., Kessels, F. J. M., & Yzermans, C. J. (2007). The influence of a disaster on the health of rescue workers: A longitudinal study. *Canadian Medical Association Journal*, 176(9), 1279–1283. <https://doi.org/10.1503/cmaj.060626>
- National Institutes of Health. (2017). Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies. <https://www.nhlbi.nih.gov/health-topics/study-quality-assessment-tools>
- Nishi, D., Koido, Y., Nakaya, N., Sone, T., Noguchi, H., Hamazaki, K., Hamazaki, T., & Matsuoka, Y. (2012). Peritraumatic distress, watching television, and posttraumatic stress symptoms among rescue workers after the great East Japan earthquake. *PLoS ONE*, 7(4), e35248. <https://doi.org/10.1371/journal.pone.0035248>
- Pourvakhshoori, N., Norouzi, K., Ahmadi, F., Hosseini, M., & Khankeh, H. (2017). Nurse in limbo: A qualitative study of nursing in disasters in Iranian context. *PLoS ONE*, 12(7), e0181314. <https://doi.org/10.1371/journal.pone.0181314>
- Resnick, H., Zuromski, K. L., Galea, S., Price, M., Gilmore, A. K., Kilpatrick, D. G., & Ruggiero, K. (2020). Prior interpersonal violence exposure and experiences during and after a disaster as predictors of posttraumatic stress disorder and depression among adolescent victims of the spring 2011 tornadoes. *Journal of Interpersonal Violence*, 35(23–24), 5179–5197. <https://doi.org/10.1177/0886260517719540>
- Rogers, B., & Lawhorn, E. (2007). Disaster preparedness: Occupational and environmental health professionals' response to hurricanes Katrina and Rita. *Official Journal of the American Association of Occupational Health Nurses*, 55(5), 197–207; quiz 208–209. <https://doi.org/10.1177/216507990705500506>
- Salopek-Žiha, D., Hlavati, M., Gvozdanović, Z., Gašić, M., Placento, H., Jakić, H., Klapan, D., & Šimić, H. (2020). Differences in distress and coping with the COVID-19 stressor in nurses and physicians. *Psychiatria Danubina*, 32(2), 287–293. <https://doi.org/10.24869/psych.2020.287>
- Smith, D., Walters, E. L., Reibling, E., Brockie, D., Lee, C., Neeki, M., Ochoa, H., Henson, T., Fiskus, J., & Thomas, T. (2020). UNIFIED: Understanding new information from emergency departments involved in the San Bernardino terrorist attack. *The Western Journal of Emergency Medicine*, 21(2), 382–390. <https://doi.org/10.5811/westjem.2019.11.43437>
- Spruce, L. (2019). Back to basics: Mass casualty incidents. *AORN Journal*, 109(1), 95–103. <https://doi.org/10.1002/aorn.12443>
- Stone, P. W. (2002). Popping the (PICO) question in research and evidence-based practice. *Applied Nursing Research: ANR*, 15(3), 197–198. <https://doi.org/10.1053/apnr.2002.34181>
- Svetlitzky, V., Farchi, M., Yehuda, B. A., Start, A. R., Levi, O., & Adler, A. B. (2019). YaHaLOM training in the military: Assessing knowledge, confidence, and stigma. *Psychological Services*, 17(2), 151–159. <https://doi.org/10.1037/ser0000360>
- Tari-Verdi, M., Miller-Hooks, E., & Kirsch, T. (2018). Strategies for improved hospital response to mass casualty incidents. *Disaster Medicine and Public Health Preparedness*, 12(6), 778–790. <https://doi.org/10.1017/dmp.2018.4>
- Thompson, J. (1993). Psychological impact of body recovery duties. *Journal of the Royal Society of Medicine*, 86(11), 628–629. [https://doi.org/10.1016/1353-1131\(94\)90016-7](https://doi.org/10.1016/1353-1131(94)90016-7)
- Thoresen, S., Birkeland, M. S., Arnberg, F. K., Wentzel-Larsen, T., & Blix, I. (2019). Long-term mental health and social support in victims of disaster: Comparison with a general population sample. *BJPsych Open*, 5(1), e2. <https://doi.org/10.1192/bjo.2018.74>
- Verschuur, M., Spinhoven, P., van Emmerik, A., & Rosendaal, F. (2007). Making a bad thing worse: Effects of communication of results of an epidemiological study after an aviation disaster. *Social Science and Medicine*, 65(7), 1430–1441. <https://doi.org/10.1016/j.socscimed.2007.05.014>
- Waters, K. A., Selander, J., & Stuart, G. W. (1992). Psychological adaptation of nurses post-disaster. *Issues in Mental Health Nursing*, 13(3), 177–190. <https://doi.org/10.3109/01612849209078772>
- World Health Organization. (2007). *Mass casualty management systems: Strategies and guidelines for building health sector capacity*. World Health Organization. [https://www.who.int/hac/techguidance/MCM\\_guidelines\\_inside\\_final.pdf](https://www.who.int/hac/techguidance/MCM_guidelines_inside_final.pdf)
- Yafe, E., Walker, B. B., Amram, O., Schuurman, N., Randall, E., Friger, M., & Adini, B. (2019). Volunteer first responders for optimizing Management of Mass Casualty Incidents. *Disaster Medicine and Public Health Preparedness*, 13(2), 287–294. <https://doi.org/10.1017/dmp.2018.56>
- Yip, J., Zeig-Owens, R., Hall, C. B., Webber, M. P., Olivieri, B., Schwartz, T., Kelly, K. J., & Prezant, D. J. (2016). Health conditions as mediators of the association between world trade center exposure and health-related quality of life in firefighters and EMS Workers. *Journal of Occupational and Environmental Medicine*, 58(2), 200–206. <https://doi.org/10.1097/JOM.0000000000000597>
- Yoo, S., Sim, M., Choi, J., Jeon, K., Shin, J., Chung, S., Hong, S. B., Lee, S. Y., & Hong, S. J. (2019). Psychological responses among humidifier disinfectant disaster victims and their families. *Journal of Korean Medical Science*, 34(4), e29. <https://doi.org/10.3346/jkms.2019.34.e29>

Zinsli, G., & Smythe, E. A. (2009). International humanitarian nursing work: Facing difference and embracing sameness. *Journal of Transcultural Nursing*, 20(2), 234–241. <https://doi.org/10.1177/1043659608330351>

#### SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

**How to cite this article:** Rodriguez-Arrastia, M., García-Martín, M., Villegas-Aguilar, E., Ropero-Padilla, C., Martín-Ibañez, L., & Roman, P. (2021). Emotional and psychological implications for healthcare professionals in disasters or mass casualties: A systematic review. *Journal of Nursing Management*, 1–12. <https://doi.org/10.1111/jonm.13474>