REVIEW

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Nurses' coping strategies caring for patients during severe viral pandemics: A mixed-methods systematic review

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Abstract

Background: Nurses play an essential role in responding to severe viral disease which bring considerable challenges to their personal and professional well-being. This subsequently can affect the delivery of care and healthcare systems' organisational capacity to respond. Understanding nurses' experiences of these challenges will help inform healthcare policies.

Aim: To explore the experiences and coping strategies of nurses caring for patients during severe viral disease pandemics.

Design: A mixed-methods systematic review informed by the Joanna Briggs Institute (JBI) methodology.

Methods: A mixed-methods systematic review. Five electronic databases Medline, CINAHL, PsychInfo, ASSIA and Scopus were searched on 4th April 2021. Results were reported in accordance with PRISMA. The findings were analysed and reported in the context of the Self-Regulatory Common-Sense Model.

Results: In total, 71 peer-review primary research articles describing nurses' experiences of caring for patients during SARS, MERS, Swine flu H1N1, Avian influenza or SARS-CoV-2 / COVID-19 published in English from 2003 to 2021 were included. We found links between nurses' perception of the health threats, their emotional reactions, and coping strategies. Perceived health threats were influenced by organisational factors including frequent changes in clinical guidelines and workplace protocols, onerous workloads and working hours, unavailability of PPE, and lack of knowledge and training in pandemic management. These impacted nurses' physical, psychological and social well-being. Nurses also reported helpful and unhelpful coping strategies to manage the health threats.

Conclusions: It is vital for stakeholders, policymakers, government and healthcare institutions to recognise and monitor the wider impact on healthcare workers from health emergencies. In addition, support to develop and implement effective systems and individual mechanisms to offset the anticipated impact pre and post pandemics/

epidemics is needed. Our findings can inform those strategies for similar future health emergencies.

Relevance to Clinical Practice: Nurses are often the first point of contact in providing direct care to patients, hence they are at high risk of being infected. The findings from this review can help managers and policymakers in developing programmes to enhance resilience in the nursing workforce.

No Patient or Public Contribution: This was a literature review study.

KEYWORDS
coping strategy, influenza outbreak, nurses' experience, pandemic, systematic review

1 | INTRODUCTION

Pandemics have significant health, social and economic implications for society. They disrupt all aspects of life including healthcare systems, economic health and the health and well-being of the healthcare workforce (Madhav et al., 2017; Seale et al., 2009). The world has experienced several pandemics, the worst, to date being the 1918 Spanish flu (H1NI) influenza pandemic in terms of reported cases (WHO, 2010). Influenza pandemic, a viral respiratory disease includes severe acute respiratory syndrome (SARS) (Maunder, 2004), H1N1 (swine flu) (Fitzgerald, 2009), Middle East Respiratory syndrome (MERS) (Kim, 2018), and currently SARS-CoV-2 (WHO, 2020). All were unpredictable, extremely contagious and caused high morbidity and mortality in the population (WHO, 2017). Writers argue that lessons should have been learned as those events were similar to the current pandemic. But globally, healthcare institutions failed to meet the challenges of SARS-CoV-2 pandemic, neglecting to protect the general population and healthcare professionals from the infectious disease (Mathews Burwell et al., 2020).

SARS-CoV-2 is a severe viral respiratory pandemic that causes Coronavirus disease 2019 (COVID-19). The virus is contagious and attacks the human respiratory and other systems. There was no pre-existing immunity to SARS-CoV-2 (Mathews Burwell et al., 2020). Since the discovery of SARS-CoV-2 in Wuhan, China in December 2019, over 535,863,000 confirmed cases of COVID-19, including over 6,314,000 deaths have been reported globally (WHO, 2022).

With the high rate of confirmed cases reported among healthcare workers (International Council of Nurses, 2020), this current pandemic will continue to cause significant emotional and physical distress to the thousands of healthcare workers (Tan et al., 2020). Considering the inconsistency in global data report coverage, the most current report estimates 115,500 healthcare workers have died from SARS-CoV-2 (WHO, 2021).

As the largest group of healthcare professionals, nurses are at the forefront of pandemics and epidemics, often providing direct care to affected patients (Fernandez et al., 2020). This role comes with increased risks of severe consequences (Mousavizadeh Merdasi et al., 2021) short and long term. Studies have indicated that nurses' physical and emotional distress is compounded by

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What does this paper contribute to the wider global clinical community?

- Nurses' experiences of caring for patients with severe viral disease outbreaks are linked to their emotional reactions and coping strategies.
- Nurses use helpful and unhelpful strategies to manage their perception of the health threat.
- There is the need to implement effective social support, improved workplace, and a better pandemic preparedness and management training for future pandemics.

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uncertainty, fear of infection, work overload and ethical dilemmas (Fernandez et al., 2020; Koh et al., 2011). Nurses have reported dermatitis, headache, dehydration, discomfort, general body pain, giddiness and excessive sweating caused by the prolonged wearing of personal protective equipment (PPE) (Erdaği Oral et al., 2022; Jose et al., 2021). These may have impacted on nurses' ability to deliver safe and effective person-centred care. To inform healthcare policies and design appropriate interventions to support nurses in any future pandemic, it is important to understand nurses' current and past experiences.

A preliminary search of the PROSPERO, Cochrane Database of Systematic Reviews and the JBI Database of Systematic Reviews and Implementation Reports revealed two systematic review protocols addressing nurses' experiences during emerging infectious diseases, one quantitative (Rozwaha et al., 2020) and one qualitative (Fernandez et al., 2020). There is a need to understand the impact of an infection outbreak (pandemic) on nurses and how they cope when caring for themselves and their patients.

1.1 | Conceptual framework

The Self-regulatory Common-Sense (SR-CSM) theoretical framework (Leventhal et al., 1980) was used to guide this review. It describes how individuals process information called cognitive

TABLE 1 Inclusion and exclusion criteria employed in the selection process.

Inclusion criteria	Exclusion criteria
• Reported on severe viral respiratory disease (pandemic)	• Reviews (systematic, rapid, integrated and other reviews), Case studies, commentaries, conference abstracts, editorials, unpublished empirical data, grey literature, validation studies, theoretical models
• Study population of nurses involved in direct care of patients with viral respiratory disease (SARS, MERS, Swine flu H1N1, Avian influenza and SARS-CoV-2 (COVID-19))	• Not published in the English language
• Peer reviewed	• Social care, primary care, residential care or care home setting
• Reported on the experiences and/or coping strategies of adult/mental health nurses who cared for infected patients	• Nurses not in direct care of patients with viral respiratory disease
• Hospital /tertiary care setting	• Study population of Midwives, Neonatal nurses, School nurses, Students nurses, Nurse assistants, Veterinary nurses, Healthcare professionals
	• Pooled analysis of healthcare professionals data
	• Studies on non-influenza pandemic (e.g. Ebola).

appraisal and respond to health threats called emotional appraisal, predict behavioural outcomes such as coping strategies. This continuous parallel processing of information makes it possible to modify the perceptions and coping mechanisms adopted (Leventhal et al., 1980, 2016). The SR-CSM defines five perceptual dimensions of a health threat as identity, causes, timeline, consequences and control. The model offers a social cognition approach to evaluate how these processes affect adaptation, and outcomes (Leventhal et al., 1980, 2016).

2 | RESEARCH AIM AND OBJECTIVES

We conducted a mixed-methods systematic review on the available literature to:

1. explore nurses' perceptions of their experiences in caring for patients during severe viral influenza outbreaks;
2. investigate the impact of the experiences on nurses' health and well-being (physical, social and psychological);
3. explore nurses' response to the health threat or experience.

3 | METHODS

3.1 | Design

To integrate qualitative and quantitative evidence in this complex research question, a mixed-methods systematic review (MMSR) was conducted. This MMSR was informed by the Joanna Briggs Institute (JBI) methodology for a MMSR (Lizarondo et al., 2020). Results were reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses updated checklist (Page et al., 2021). The checklist is included as Appendix S1.

3.2 | Search strategy

A database systematic search for published studies was undertaken on 4th May 2021 using five electronic databases including Medline, Cumulative Index to Nursing and Allied Health Literature (CIHAHL), PsychInfo, ASSIA and Scopus. A subject specialist librarian with systematic reviewing expertise assisted in creating an exhaustive search strategy. The keywords and index terms in relevant article titles and abstracts were used to create a comprehensive search string which was applied to all five included databases. The following keywords variations were used in the search string: "Experience" (MeSH) OR perception OR "lived experience" OR opinion OR understanding OR belief OR view OR judgement OR attitude OR perspective AND "influenza outbreak" (MeSH), OR "pandemic" OR "epidemic" OR "disaster" OR "severe acute respiratory syndrome" OR "SARS-CoV" OR "Middle East respiratory syndrome coronavirus" OR "MERS-CoV" OR "Swine flu", OR "H1N1" OR "Avian Influenza" OR "H5N1" OR "Covid-19" OR "SARS-CoV-2" OR "coronavirus" AND "Nurse" (MeSH) OR "Registered Nurse" OR "nursing staff". The full search strategies are provided in Table S1.

3.3 | Selection criteria

Primary qualitative, quantitative and mixed-methods studies published in the English language from January 2003 to May 2021 were included. The WHO definition and classification of disease for severe viral (influenza) outbreaks including SARS, MERS, Swine flu H1N1, Avian influenza and SARS-CoV-2 or COVID-19 was used. Influenza refers to an acute viral infection that spreads easily from person to person in any age group and can cause serious complications (WHO, 2016a). This becomes a pandemic when it spreads globally, or an epidemic when limited to a small geographical area to which there is little or no pre-existing immunity in the human

population (WHO, 2016a). To be included in the review, a study had to meet the inclusion criteria summarised in Table 1.

3.4 | Search outcome and study selection

In total, 4351 citations were identified through the literature search and exported to EndNote X9.2 (Clarivate Analytics), and 684 duplicates were removed. Using Covidence systematic review management software v2627, titles and abstracts were screened by the first author (ET) for assessment against the review's inclusion criteria. Subsequently, 115 citations were included for full-text review. Three review authors (ET, RP and RH) independently screened and assessed the full-text articles for congruence with the inclusion criteria. Of these full-text articles, 39 were excluded with reasons given in the PRISMA flow diagram (Figure 1). Any disagreements between the three reviewers were resolved by a fourth reviewer (DW). A total of 71 peer-reviewed articles were included in the final review.

3.5 | Data extraction

Data extraction was performed using a modified version of the standardised JBI data extraction tool in JBI SUMARI. Data information recorded for each study included author, year of publication, geographical location, study methods, time-frame of data collection, participant characteristics, outcomes measured, measurement methods, analysis and description of main results. Data extraction was performed by the main author (ET) and cross-checked by two review authors (CB and TW). Discrepancies were resolved through discussions among the three reviewers (ET, CB and TW).

3.6 | Quality appraisal

Study quality was assessed by two independent reviewers (ET and AS) using the JBI critical appraisal tools specific to the type of study. Eligible qualitative studies and the qualitative component of mixed-methods studies were evaluated using the standardised JBI qualitative
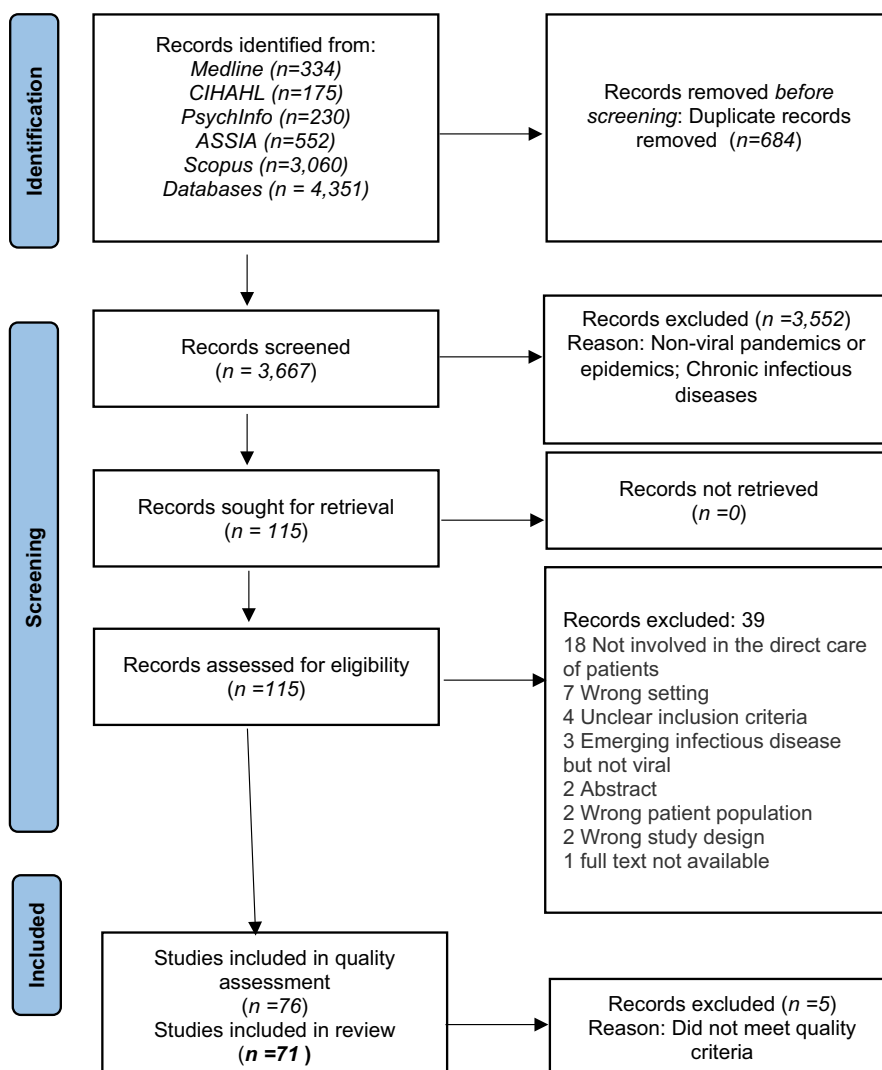

FIGURE 1 PRISMA updated flow diagram (Page et al., 2021).

critical appraisal tool. Included quantitative studies and the quantitative component of mixed-methods studies were also appraised using the standardised JBI quantitative critical appraisal tool. Any disagreement arising between reviewers was resolved through discussion.

Each parameter assessed by the appraisal tool was assigned a quality percentage score. Studies scoring below 50% were deemed low quality and excluded. Five studies were excluded based on the quality threshold. Table S1 indicates how the identified studies were appraised for quality.

3.7 | Data synthesis

Data synthesis and integration was carried out using JBI SUMARI according to the JBI convergent integrated approach. All data sets (qualitative, quantitative and mixed-methods studies) were extracted simultaneously, transformed and then analysed in parallel (Lizarondo et al., 2020). The process entailed converting quantitative data into themes (qualitised data). To develop a collection of integrated findings, data were categorised and pooled together based on similarity in meaning. Leventhal et al.'s (1980) SR-CSM theoretical framework was used to develop a priori a set of themes for reporting the findings of this review (Lizarondo et al., 2020).

4 | RESULTS

4.1 | Characteristics of included studies

The characteristics of the included 71 studies are summarised in Table S1. Of these 26 were quantitative, 39 were qualitative and 6 were mixed-method studies published between 2005 and 2021. The quantitative studies and the quantitative components of the mixed-methods studies were mainly cross-sectional designs. The qualitative studies and the qualitative components of the mixed-methods were predominantly descriptive phenomenological studies. Fourteen studies did not state when data were collected. Participants worked in various hospital settings and cared for patients with severe viral disease. In most studies female nurses predominated. Only, one study (Hoseinabadi et al., 2020) reported more male participants ($n = 82$) than females ($n = 69$). As shown in Figure 2, most studies were conducted in China ($n = 17$). The remaining studies were conducted in Iran ($n = 10$), South Korea ($n = 8$), Turkey ($n = 7$), United States ($n = 6$), Italy ($n = 4$), Taiwan ($n = 3$), Hong Kong ($n = 2$), Canada ($n = 2$), Saudi Arabia ($n = 2$), Spain($n = 2$), Lebanon ($n = 1$), Ecuador ($n = 1$), Jordan ($n = 1$), Brazil ($n = 1$), Japan ($n = 1$), Philippines ($n = 1$), Indonesia ($n = 1$) and New Zealand ($n = 1$).

4.2 | Quality of the included studies

The overall quality of the included studies was moderate (50%) to high (100%) (see Table S1). Four included studies (Crowe et al., 2021;

Honey & Wang, 2013; Murat et al., 2021; Santos et al., 2021) scored below 70% but 50% and above due to methodological inconsistencies. While all 31 included quantitative studies identified confounding factors such, only 14 clearly stated strategies to deal with these factors. The majority of the qualitative studies inadequately described the researcher's influence on the research, and none considered the relationship between the researcher and the participants. Participants and their voices were not sufficiently represented in five included studies (Chiang et al., 2007; He et al., 2021; Honey & Wang, 2013; Logiudice & Bartos, 2021; Santos et al., 2021).

4.3 | Review findings

This review explored nurses' experiences and coping strategies while caring for patients with severe viral disease during an outbreak (pandemic). The SR-CSM describes how individuals process information and respond emotionally and behaviourally to health threats. These perceptions about a health threat determine the coping strategies and outcomes. The continuous parallel processing of information makes it possible to modify the perceptions and coping mechanisms adopted (Leventhal et al., 1980, 2016). The findings are discussed across the themes outlined below.

4.4 | Nurses' perception of the severe viral disease

The literature clearly shows caring for patients with severe viral disease during an outbreak is challenging (Gordon et al., 2021; He et al., 2021; Lapum et al., 2021; Liu et al., 2020). Nurses reported both organisational factors (external stimuli) and their emotional reactions (internal stimuli) significantly influenced them in caring for patients.

4.4.1 | Organisational factors (external stimuli)

Frequent changes in clinical guidelines, workplace protocols, heavy workloads and working hours, availability of personal protective equipment (PPE) and isolated working environments were the most extensively described organisational factors in the studies.

Responding to the constant changing and even conflicting clinical guidelines was challenging for nurses (Crowe et al., 2021; Fernández-Castillo et al., 2021; Gonzalez-Gil et al., 2021; Schroeder et al., 2020) who also reported 'excessive' workload and long working hours (Catania et al., 2021; Cui et al., 2020; Doo et al., 2021; Fernández-Castillo et al., 2021; Gonzalez-Gil et al., 2021; Gunawan et al., 2021; He et al., 2021; Hong et al., 2021; Hoseinabadi et al., 2020; Kang et al., 2018; Karimi et al., 2020; Li et al., 2021; Moradi et al., 2021; Pourteimour et al., 2020; Sagherian et al., 2020; Labrague & de Los Santos, 2021; Shih et al., 2009; Sun et al., 2020; Tan et al., 2020; Vitale et al., 2021; Wang et al., 2021; Zhan et al., 2020). Though many nurses were aware of workplace protocols and clinical
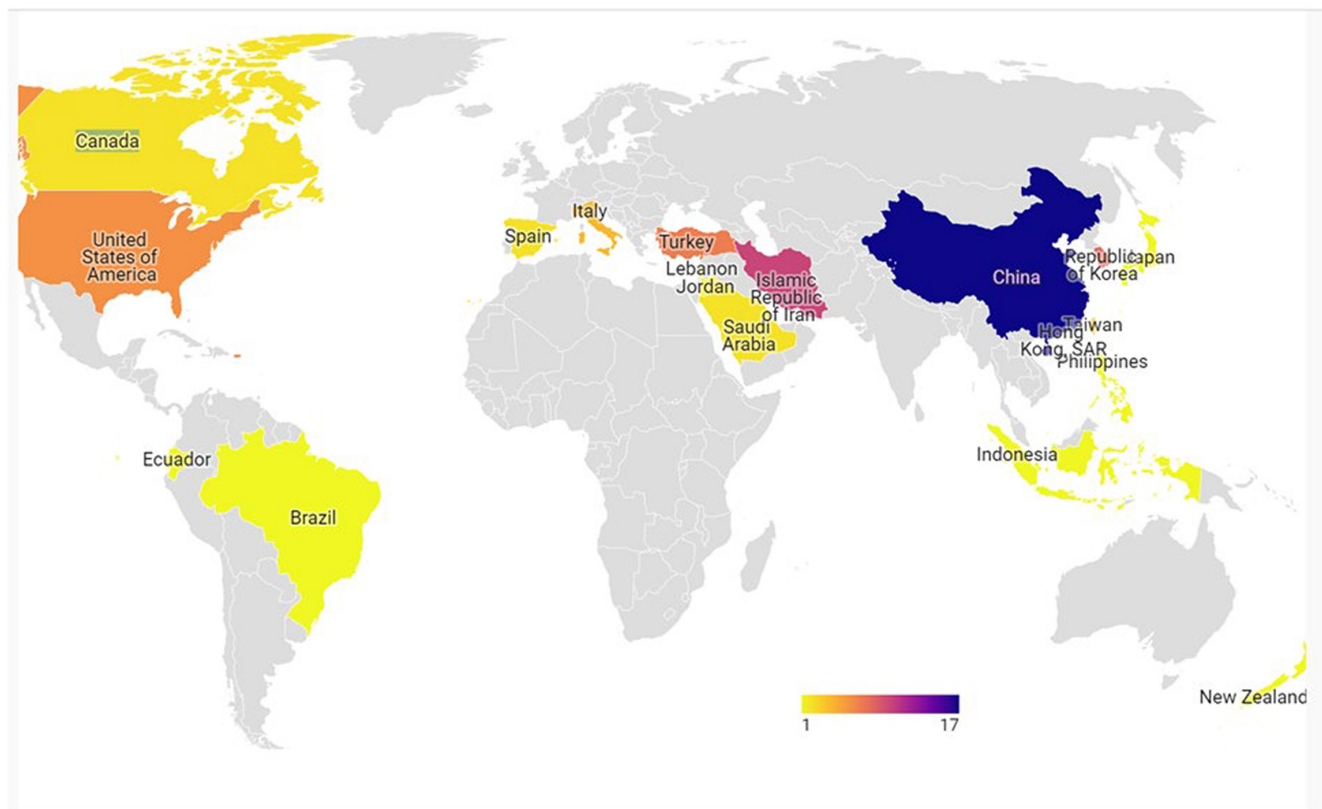
FIGURE 2 Geographical distribution of the included studies.

guidelines (Santos et al., 2021), they felt vulnerable and under pressure to keep up with the constant change in clinical guidelines and protocols (Catania et al., 2021; Crowe et al., 2021; Kim, 2018; Lapum et al., 2021; Lee et al., 2005, 2020; Lee & Lee, 2020; Logiudice & Bartos, 2021; Robinson & Kellam Stinson, 2021; Santos et al., 2021; Schroeder et al., 2020; Shih et al., 2009).

While some nurses reported that their employers tried to provide adequate PPE (Robinson & Kellam Stinson, 2021; Schroeder et al., 2020), they reported there was an inadequate supply of PPE. This resulted in anxiety, frustrations and reduced work efficiency (Catania et al., 2021; Çınar et al., 2021; Franco Coffré et al., 2020; Gonzalez-Gil et al., 2021; Gunawan et al., 2021; Kalateh Sadati et al., 2021; Lee et al., 2005; Lee & Lee, 2020; Leng et al., 2021; Moradi et al., 2021; Murat et al., 2021; Santos et al., 2021; Sun et al., 2020; Xu et al., 2021). In addition, nurses questioned the effectiveness of the available PPE (Crowe et al., 2021; Liu et al., 2020). The PPE provided was described as not 'user-friendly' (Lam & Hung, 2013). This intensified their perception of personal danger (Chung et al., 2005; Lee et al., 2020) leading to inadequacy in providing nursing care to patients (Karimi et al., 2020; Murat et al., 2021; Muz & Erdoğan Yüce, 2020).

Caring for infected patients in isolated environments heightened nurses' fears and concerns. Changes in their work environment (Catania et al., 2021; Gordon et al., 2021; Han et al., 2020; Lee & Lee, 2020; Leng et al., 2021; Sun et al., 2020), high mortality rates (Kackin et al., 2021; Karimi et al., 2020; Shih et al., 2009), unclear

treatments and diagnostic tests (Santos et al., 2021) further influenced care quality. These factors were perceived to reduce the optimal delivery of safe and effective patient care (Deliktas Demirci et al., 2021; Lee & Lee, 2020), and challenged nurses' professional accountability to patients (Catania et al., 2021; Fawaz & Itani, 2021; Fernández-Castillo et al., 2021; Rezaee et al., 2020). Although nurses are obliged to provide person-centred, and compassionate care (Chiang et al., 2007; Wang et al., 2021), some reported they 'cannot be at patient's bedside when he/she needs us' (Rezaee et al., 2020) due to the challenging conditions.

4.4.2 | Emotional reactions (internal stimuli)

Nurses' reported that due to the unclear information and evidence about the health occurrences (Arcadi et al., 2021; Chiang et al., 2007; Lee & Lee, 2020; Ohta et al., 2020), they were concerned they were at a high risk of being infected with the virus and transmitting it to their families and people they cared about (Al Muharraq, 2021; Arcadi et al., 2021; Chiang et al., 2007; Cho & Kim, 2021; Doo et al., 2021; Franco Coffré et al., 2020; Galehdar et al., 2021; Gonzalez-Gil et al., 2021; Gordon et al., 2021; Kackin et al., 2021; Kim, 2018; Labrague and Santos et al., 2021; Lam & Hung, 2013; Liu et al., 2020; Leng et al., 2021; Murat et al., 2021; Sheng et al., 2020; Shih et al., 2009; Vitale et al., 2021; Xu et al., 2021; Zhang et al., 2020). Many reported being concerned about their

personal safety and that of their families, colleagues and patients (Jia et al., 2021; Lam & Hung, 2013; Lee et al., 2005; Logiudice & Bartos, 2021; Shih, 2007).

The fear of becoming infected was reported in all included studies. Keeping family members safe was prioritised, with some nurses opting for self-isolation, restricting social interactions and contacts with family and friends (Han et al., 2020; Lam & Hung, 2013). Fear led to uncertainty and insecurity in the nurses' lives (Moradi et al., 2021; Santos et al., 2021). Nurses reported feeling 'frightened' (Danielis et al., 2021) over something that was not known (Arcadi et al., 2021; Cui et al., 2020; Deliktas Demirci et al., 2021; Fernández-Castillo et al., 2021; Jia et al., 2021; Lee & Lee, 2020; Santos et al., 2021; Su et al., 2007).

Training was an important factor in reducing fear in nurses (Cui et al., 2020; Santos et al., 2021; Sun et al., 2020), but as viral respiratory outbreaks require urgent responses, nurses had inadequate time to train and gain sufficient knowledge to enable them to care safely and effectively for infected patients (Lee & Lee, 2020; Liu et al., 2020; Ohta et al., 2020; Shih et al., 2009). While some nurses had brief training (Han et al., 2020; He et al., 2021; Liu et al., 2020), others had none (Catania et al., 2021). Thus, nurses reported feeling inadequate with a low sense of responsibility, lack of knowledge (Arcadi et al., 2021; Danielis et al., 2021; Gordon et al., 2021; He et al., 2021; Jia et al., 2021; Lee et al., 2005, 2020; Leng et al., 2021; Murat et al., 2021; Tan et al., 2020) and a strong sense of powerlessness (Chung et al., 2005; Fernández-Castillo et al., 2021; Jia et al., 2021; Lapum et al., 2021; Lee et al., 2005, 2020; Sheng et al., 2020; Shih et al., 2009; Sun et al., 2020; Tan et al., 2020).

4.4.3 | Control

Dismayed by the sudden interruption to work and life, nurses believed they had little or no control over the health threat (Catania et al., 2021; Deliktas Demirci et al., 2021; Hong et al., 2021; Yildirim et al., 2021). This lack of control was worsened by media reports that circulated contradictory information (Fernández-Castillo et al., 2021; Schroeder et al., 2020) resulting in information overload (Ohta et al., 2020).

The perception of low control led to high levels of anxiety, stress, depression, panic attacks, frustrations, self-blame and poor mental health among nurses (Bahadir-Yilmaz & Yüksel, 2020; Chung et al., 2005; Crowe et al., 2021; Doo et al., 2021; Fawaz & Itani, 2021; Gordon et al., 2021; Heo et al., 2021; Hong et al., 2021; Karimi et al., 2020; Kim, 2018; Lee et al., 2005; Lee & Lee, 2020; Liu et al., 2020; Logiudice & Bartos, 2021; Murat et al., 2021; Robinson & Kellam Stinson, 2021; Sun et al., 2020; Tan et al., 2020; Vitale et al., 2021; Yildirim et al., 2021; Zhan et al., 2020; Zhang et al., 2020). Besides these experiences, Abu Sharour et al. (2021) and Heo et al. (2021) reported that nurses exhibited good levels of 'self-efficacy' and 'self-confidence' in providing care for infected patients and experienced a strong sense of professional solidarity

among clinical staff during outbreaks (Catania et al., 2021; Chiang et al., 2007; Lee & Lee, 2020; Liu & Liehr, 2009; Robinson & Kellam Stinson, 2021; Schroeder et al., 2020; Sun et al., 2020; Xu et al., 2021).

Of major concern are symptoms of post-traumatic stress disorder (PTSD). Burnout, emotional exhaustion, obsessions, suspicions, loneliness (Crowe et al., 2021; Deliktas Demirci et al., 2021; Galehdar et al., 2020, 2021; Gonzalez-Gil et al., 2021; Gunawan et al., 2021; He et al., 2021; Hoseinabadi et al., 2020; Kackin et al., 2021; Labrague and Santos et al., 2021; Lapum et al., 2021; Leng et al., 2021; Li et al., 2021; Moradi et al., 2021; Ohta et al., 2020; Sagherian et al., 2020; Shih et al., 2009; Su et al., 2007; Wang et al., 2021) and suicidal ideation were all reported (Hong et al., 2021) among nurses.

Reports of the impact of the pandemic on resilience are contradictory, while Doo et al. (2021) reported resilience was considerably lower in nurses who cared for infected patients, Logiudice and Bartos (2021) reported the opposite. Lapum et al. (2021) assert that the resilience acquired through nurses' experiences will provide protection in future situations.

4.5 | Impact

4.5.1 | Disturbance in physical well-being

Nurses' ability to meet patients' needs were compromised by the overwhelming physical exhaustion and discomfort associated with wearing PPE (Franco Coffré et al., 2020; Honey et al., 2013; Kim, 2018; Lam & Hung, 2013; Lapum et al., 2021; Leng et al., 2021; Liu et al., 2020; Liu & Liehr, 2009; Logiudice & Bartos, 2021; Moradi et al., 2021; Robinson and Kellam 2021; Sagherian et al., 2020; Sheng et al., 2020; Sun et al., 2020). The continuous cycle of donning and doffing masks, face shields, hairnets and gowns were described as cumbersome and energy sapping.

Physical symptoms of headaches, dizziness, muscle pain, breathlessness, dermatitis, raised body temperature, sweating and poor vision were widely reported (Bahadir-Yilmaz & Yüksel, 2020; Chung et al., 2005; Cui et al., 2020; Galehdar et al., 2020, 2021; Gordon et al., 2021; Hong et al., 2021; Kang et al., 2018; Laudanski et al., 2021; Lee et al., 2020; Lee & Lee, 2020; Leng et al., 2021; Moradi et al., 2021; Muz & Erdoğan Yüce, 2020; Vitale et al., 2021; Wang et al., 2021). These symptoms further impacted on sleep disturbances (Cui et al., 2020; Galehdar et al., 2021; Gordon et al., 2021; Leng et al., 2021; Sagherian et al., 2020; Su et al., 2007; Vitale et al., 2021; Yildirim et al., 2021).

4.5.2 | Social well-being

Some nurses reported being stigmatised and discriminated against within their communities (Gordon et al., 2021; Gunawan et al., 2021; Kackin et al., 2021; Kim, 2018; Lee & Lee, 2020; Park

et al., 2018; Rezaee et al., 2020; Yildrim et al., 2021). Studies reported that nurses were thought of as the virus (Deliktas Demirci et al., 2021), considered a source of viral transmission (Kackin et al., 2021; Lee & Lee, 2020; Moradi et al., 2021), and that some friends, family members and work colleagues approached them with fear and caution (Deliktas Demirci et al., 2021; Muz & Erdoğan Yüce, 2020; Ohta et al., 2020). This resulted in nurses feeling alienated, isolated and forced to be separated from families and friends (Galehdar et al., 2021; Karimi et al., 2020; Lapum et al., 2021; Lee et al., 2020; Moradi et al., 2021; Murat et al., 2021; Robinson & Kellam Stinson, 2021). This discrimination was extended to their family members (Kim, 2018) and to prevent being rejected and ostracised by their community, some nurses avoided disclosing their profession (Chiang et al., 2007).

4.6 | Response

As a consequence of the threat perception, nurses reported a range of problem-focused and emotion-focused coping strategies. Problem-focused coping included increasing their knowledge about the disease (Abu Sharour et al., 2021; Al Muharraq, 2021; Franco Coffré et al., 2020; Zhang et al., 2020), obtaining support from families and friends (Crowe et al., 2021; Deliktas Demirci et al., 2021; Franco Coffré et al., 2020; Jia et al., 2021), deliberately fostering positive thoughts (Kackin et al., 2020) and engaging in new and old hobbies (Crowe et al., 2021; Jia et al., 2021).

In addition, nurses reported using emotion-focused coping strategies such as using humour, avoidance behaviour including social isolation, or problem-focused strategies such as mindfulness techniques, distraction and reducing working hours (Çınar et al., 2021; Lam & Hung, 2013; Pasay-an, 2020; Sun et al., 2020). They also described finding comfort in cooking, reading books, painting, shopping, watching movies, exercising (Deliktas Demirci et al., 2021; Gordon et al., 2021; Kackin et al., 2021; Lee et al., 2005; Robinson & Kellam Stinson, 2021) and participating in healing programmes (Kang et al., 2018).

Accepting social support from either family, friends or the public was used as problem-focused coping strategies, with nurses reporting that it motivated them to continue to care for infected patients (Kalateh Sadati et al., 2021; Kang et al., 2018; Leng et al., 2021; Sheng et al., 2020; Su et al., 2007; Sun et al., 2020).

Some studies identified a variety of organisational strategies to assist nurses during viral respiratory disease outbreaks. These included financial incentives or bonuses (Abu Sharour et al., 2021; Franco Coffré et al., 2020; Jia et al., 2021; Kang et al., 2018; Sheng et al., 2020), frequent communications from leaders (Leng et al., 2021; Jia et al., 2021), counselling sessions (Cui et al., 2020), improved working conditions (Abu Sharour et al., 2021; Deliktas Demirci et al., 2021; Hoseinabadi et al., 2020; Lam & Hung, 2013; Lyu et al., 2020) and regular educational programmes (Kang et al., 2018; Lee et al., 2005). The studies urged the need for more of these interventions (Yildirim et al., 2021) to boost morale (Lee et al., 2005).

5 | DISCUSSION

This review highlights what is known about the experiences and coping strategies of nurses caring for patients with severe viral disease during an outbreak. Reports of low control, powerlessness and adverse psychological outcomes were common which in turn reduced coping strategies. Evidence relating to work-related stress in the healthcare sector during pandemics is mounting (Saragih et al., 2021), calling for policy reform and systems level changes in the working environment (West et al., 2020).

Nurses play a key role in any healthcare system, responding to complex humanitarian crises and disasters and provide broad services in different settings (World Health Organization (WHO), 2016a, 2016b; National Audit Office, 2020). Most often, they are frontline responders, spending more time with patients than other healthcare professionals and are considered the most reliable health professionals (Rosa et al., 2020). Frequent changes in clinical guidelines and workplace protocols, heavy workloads and working hours, unavailability of PPE and lack of knowledge and training led to feelings of low personal control. This impacted on nurses' ability to perform basic clinical procedures and providing care for the many patients dying during this pandemic. It also impacted on their own ability to stay healthy. Governments and healthcare providers are urged to provide decent working conditions and increase nurses' autonomy in decision-making and clinical practice (Holloway et al., 2021; World Health Organization (WHO), 2016a, 2016b).

Feelings of powerlessness led to other adverse psychological outcomes including anxiety, stress, depression, panic attacks, frustration, insomnia and self-blame. Our findings are consistent with longitudinal study conducted over the first phase of the COVID-19 pandemic which reported that the UK nursing and midwifery workforce experienced a high prevalence of adverse psychological effects (Couper et al., 2022). Female and young nurses are particularly vulnerable to distress compared to male nurses. To mitigate this impact, healthcare institutions are advised to provide clear communication, and proactive psychosocial support for healthcare workers amidst pandemics (Gee & Skovdal, 2017).

Many challenges are inherent to the nursing role (Botha et al., 2015), but prolonged or intense challenge from a pandemic generates fear and an atmosphere of unease while caring for infected patients (Vizheh et al., 2020). Relevant and current information, resources and disaster-based training (Al Thobaity & Alshammari, 2020; Lee et al., 2021), better preparedness and building healthcare professionals' resilience prior to pandemics (Aiello et al., 2011) may off-set this fear.

The control element of the SR-CSM depicts an individual's beliefs about how much the health threat can be managed or kept under control. Perceptions of low control are associated with more stress and the view that the health threat is uncontrollably complemented by unpleasant severe consequences (Hagger & Orbell, 2003). On the other hand, high control over the health threat is associated with positive outcomes of physical, social and psychological well-being (Hagger & Orbell, 2003). Individual

coping strategies such as using social support, attending educational programmes, increasing knowledge about the disease and engaging in different hobbies are helpful, but in the absence of social support are not enough to regulate levels of stress and may lead to decreased job satisfaction (Lim et al., 2010) and staff potentially leaving the profession (International Council of Nurses, 2021). Workplace factors have been shown to mitigate experiences in pandemics and epidemics (Koh et al., 2011) and organisations as responsible employers could make use of these at these challenging times.

5.1 | Strength and limitations

More than one reviewer was involved to reduce bias in the screening process. Quality assessment was carried out using the standardised JBI critical appraisal approach. The data synthesis and findings drew explicitly on an established theoretical framework which guided the interpretation and presentation of the empirical evidence identified, further reducing bias in reporting the review findings.

We acknowledge the review only included studies published in academic journals and English language. Some grey literature and articles published in other languages may have unintentionally been missed. In addition, we did not include studies after 4th May 2021 and therefore may have missed more recent studies on this topic. The majority of the participants in the included studies were female nurses, which may limit the generalisability of our findings to the wider nursing workforce.

6 | CONCLUSIONS

Nurses experienced considerable physical, psychological and social challenges in the recent pandemic. These challenges impact on nurses' well-being affecting the delivery of care, collaborative work and organisational efficacy. Social support, improved workplace and training can help mitigate the challenges and it is vital for stakeholders, policymakers, the government and healthcare institutions to recognise and monitor nurses' needs to develop and implement effective supportive systems pre and post-pandemics.

7 | RELEVANCE FOR CLINICAL PRACTICE

Nurses are often the first point of contact in providing direct care to patients, hence they are at high risk of being infected. This pandemic was an opportunity to develop a long-term plan to counter the threat to health. Nursing staff need a system that keeps them well informed, supported (professionally and personally) and safe. When events do happen, there will be consequences that affect individuals and the duty of a good employer is to have a way of repairing any damage to those individuals if they are to maintain a healthy workforce. The findings from this review can help managers and

policymakers in developing programmes to enhance resilience in the nursing workforce.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The authors confirm that the data supporting the findings of this study are available within the article [and/or] its supplementary material.

REGISTRATION

The protocol was registered with the International Prospective Register of Systematic Reviews database (CRD42021253378) on 7th May 2021. https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=253378

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REFERENCES

Abu Sharour, L., Bani Salameh, A., Suleiman, K., Subih, M., El-Hneiti, M., Al-Husaami, M., Al Dameery, K., & Al Omari, O. (2021). Nurses' self-efficacy, confidence and interaction with patients with COVID-19: A cross-sectional study. *Disaster Medicine and Public Health Preparedness.* https://doi.org/10.1017/dmp.2021.1

Aiello, A., Young-Eun Khayeri, M., Raja, S., Peladeau, N., Romano, D., Leszcz, M., Maunder, R. G., Rose, M., Adam, M. A., Pain, C., Moore, A., Savage, D., & Bernard Schulman, R. (2011). Resilience training for hospital workers in anticipation of an influenza pandemic. *Journal of Continuing Education in the Health Professions*, 31(1), 15–20. https://doi.org/10.1002/CHP.20096

Al Muharraq, E. H. (2021). The psychological impact of coronavirus disease 2019 on Nurses in Saudi Arabia and their coping strategies. *SAGE Open Nursing*, 7. https://doi.org/10.1177/23779608211011322

Al Thobaity, A., & Alshammari, F. (2020). Nurses on the frontline against the COVID-19 pandemic: An integrative review. *Dubai Medical Journal*, 3(3), 87–92. https://doi.org/10.1159/000509361

Arcadi, P., Simonetti, V., Ambrosca, R., Cicolini, G., Simeone, S., Pucciarelli, G., Alvaro, R., Vellone, E., & Durante, A. (2021). Nursing during the COVID-19 outbreak: A phenomenological study. *Journal of Nursing Management*, 29, 1111–1119.

Audit Office, N. (2020). *The NHS nursing workforce A picture of the National Audit Office logo.* https://www.nao.org.uk/wp-content/uploads/2020/03/The-NHS-nursing-workforce.pdf

Bahadir-Yilmaz, E., & Yüksel, A. (2020). State anxiety levels of nurses providing care to patients with COVID-19 in Turkey. *Perspectives in Psychiatric Care, October*, 57(3), 1088–1094. https://doi.org/10.1111/ppc.12661

Botha, E., Gwin, T., & Purpora, C. (2015). The effectiveness of mindfulness based programs in reducing stress experienced by nurses in adult hospital settings: A systematic review of quantitative evidence protocol. *JBI Database of Systematic Reviews and Implementation Reports*, *13*(10), 21–29. https://doi.org/10.11124/JBISRIR-2015-2380

Catania, G., Zanini, M., Hayter, M., Timmins, F., Dasso, N., Ottonello, G., Aleo, G., Sasso, L., & Bagnasco, A. (2021). Lessons from Italian front-line nurses' experiences during the COVID-19 pandemic: A qualitative descriptive study. *Journal of Nursing Management*, *29*(3), 404–411. https://doi.org/10.1111/jonm.13194

Chiang, H. H., Chen, M. B., & Sue, I. L. (2007). Self-state of nurses in caring for SARS survivors. *Nursing Ethics*, *14*(1), 18–26. https://doi.org/10.1177/0969733007071353

Cho, K. H., & Kim, B. (2021). Article the psychological responses of nurses caring for COVID-19 patients: A q methodological approach. *International Journal of Environmental Research and Public Health*, *18*(7), 3605.

Chung, B. P. M., Wong, T. K. S., Suen, E. S. B., & Chung, J. W. Y. (2005). SARS: Caring for patients in Hong Kong. *Journal of Clinical Nursing, 14*(4), 510–517. https://doi.org/10.1111/j.1365-2702.2004.01072.x

Çınar, D., Kılıç Akça, N., Zorba Bahçeli, P., & Bağ, Y. (2021). Perceived stress and affecting factors related to COVID-19 pandemic of emergency nurses in Turkey. *Journal of Nursing Management*, *29*(7), 1916–1923. https://doi.org/10.1111/jonm.13329

Couper, K., Murrells, T., Sanders, J., Anderson, J. E., Blake, H., Kelly, D., Kent, B., Maben, J., Rafferty, A. M., Taylor, R. M., & Harris, R. (2022). The impact of COVID-19 on the wellbeing of the UK nursing and midwifery workforce during the first pandemic wave: A longitudinal survey study. *International Journal of Nursing Studies*, *127*, 104155. https://doi.org/10.1016/j.ijnurstu.2021.104155

Crowe, S., Howard, A. F., Vanderspank-Wright, B., Gillis, P., McLeod, F., Penner, C., & Haljan, G. (2021). The effect of COVID-19 pandemic on the mental health of Canadian critical care nurses providing patient care during the early phase pandemic: A mixed method study. *Intensive & Critical Care Nursing*, *63*, 102999. N.PAG-N.PAG. https://doi.org/10.1016/j.iccn.2020.102999

Cui, S., Zhang, L., Yan, H., Shi, Q., Jiang, Y., Wang, Q., & Chu, J. (2020). Experiences and psychological adjustments of nurses who voluntarily supported covid-19 patients in Hubei Province, China. *Psychology Research and Behavior Management*, *13*, 1135–1145. https://doi.org/10.2147/PRBM.S283876

Danielis, M., Peressoni, L., Piani, T., Colaetta, T., Mesaglio, M., Mattiussi, E., & Palese, A. (2021). Nurses' experiences of being recruited and transferred to a new sub-intensive care unit devoted to COVID-19 patients. *Journal of Nursing Management*, *29*(5), 1149–1158. https://doi.org/10.1111/jonm.13253

Deliktas Demirci, A., Oruc, M., & Kabukcuoglu, K. (2021). 'It was difficult, but our struggle to touch lives gave us strength': The experience of nurses working on COVID-19 wards. *Journal of Clinical Nursing*, *30*(5/6), 732–741. https://doi.org/10.1111/jocn.15602

Doo, E. Y., Kim, M., Lee, S., Lee, S. Y., & Lee, K. Y. (2021). Influence of anxiety and resilience on depression among hospital nurses: A comparison of nurses working with confirmed and suspected patients in the COVID-19 and non-COVID-19 units. *Journal of Clinical Nursing*, *30*(13–14), 1990–2000. https://doi.org/10.1111/jocn.15752

Erdaği Oral, S., Karabağ Aydin, A., & Kirici, D. (2022). Physical problems and fatigue level of nurses during the COVID-19 pandemic. *Nursing Forum*. https://doi.org/10.1111/nuf.12833

Fawaz, M., & Itani, M. (2021). The psychological experiences of Lebanese ground zero front-line nurses during the most recent COVID-19 outbreak post Beirut blast: A qualitative study. *The International Journal of Social Psychiatry*. https://doi.org/10.1177/00207640211004989

Fernandez, R., Lord, H., Halcomb, E., Moxham, L., Middleton, R., Alananzeh, I., & Ellwood, L. (2020). Implications for COVID-19: A systematic review of nurses' experiences of working in acute care hospital settings during a respiratory pandemic. In *International journal of nursing studies* (Vol. *111*, p. 103637). Elsevier Ltd.. https://doi.org/10.1016/j.ijnurstu.2020.103637

Fernández-Castillo, R. J., González-Caro, M. D., Fernández-García, E., Porcel-Gálvez, A. M., & Garnacho-Montero, J. (2021). Intensive care nurses' experiences during the COVID-19 pandemic: A qualitative study. *Nursing in Critical Care*, *26*(5), 397–406. https://doi.org/10.1111/nicc.12589

Fitzgerald, D. A. (2009). Human swine influenza A [H1N1]: Practical advice for clinicians early in the pandemic. *Paediatric Respiratory Reviews*, *10*(3), 154–158. https://doi.org/10.1016/j.prrv.2009.06.005

Franco, J. A., & PLÁ, L. (2020). Feelings, stress, and adaptation strategies of Nurses against COVID-19 in Guayaquil. *Investigacion y Educacion En Enfermeria*, *38*(3), 1–14. https://doi.org/10.17533/UDEA.IEE.V38N3E07

Galehdar, N., Kamran, A., Toulabi, T., & Heydari, H. (2020). Exploring nurses' experiences of psychological distress during care of patients with COVID-19: A qualitative study. *BMC Psychiatry*, *20*(1). https://doi.org/10.1186/s12888-020-02898-1

Galehdar, N., Toulabi, T., Kamran, A., Heydari, H., Galehdar Toulabi, T., Kamran, A., & Heydari, H. (2021). Exploring nurses' perception of taking care of patients with coronavirus disease (COVID-19): A qualitative study. *Nursing Open*, *8*(1), 171–179. https://doi.org/10.1002/nop2.616

Gee, S., & Skovdal, M. (2017). The role of risk perception in willingness to respond to the 2014–2016 West African Ebola outbreak: A qualitative study of international health care workers. *Global Health Research and Policy 2017 2*, *2*(1), 1–10. doi:10.1186/S41256-017-0042-Y

Gonzalez-Gil, M. T., Gonzalez-Blazquez, C., Parro-Moreno, A. I., Pedraz-Marcos, A., Palmar-Santos, A., Otero-Garcia, L., Navarta-Sanchez, M. V., Alcolea-Cosin, M. T., Arguello-Lopez, M. T., Canalejas-Perez, C., Carrillo-Camacho, M. E., Casillas-Santana, M. L., Diaz-Martinez, M. L., Garcia-Gonzalez, A., Garcia-Perea, E., Martinez-Marcos, M., Martinez-Martin, M. L., Palazuelos-Puerta, M. D. P., Sellan-Soto, C., & Oter-Quintana, C. (2021). Nurses' perceptions and demands regarding COVID-19 care delivery in critical care units and hospital emergency services. *Intensive & Critical Care Nursing*, *62*, 102966. https://doi.org/10.1016/j.iccn.2020.102966

Gordon, J. M., Magbee, T., & Yoder, L. H. (2021). The Eexperiences of critical care nurses caring for patients with COVID-19 during the 2020 pandemic: A qualitative study. *Applied Nursing Research*, *59* C.1097%2FNNA.0000000000000900.

Gunawan, J., Aungsuroch, Y., Marzilli, C., Fisher, M. L., Nazliansyah, & Sukarna, A. (2021). A phenomenological study of the lived experience of nurses in the battle of COVID-19. *Nursing Outlook*. https://doi.org/10.1016/j.outlook.2021.01.020

Hagger, M. S., & Orbell, S. (2003). A meta-analytic review of the common-sense model of illness representations. *Psychology & Health*, *18*(2), 141–184. https://doi.org/10.1080/088704403100081321

Han, L., Wong, F. K. Y., She, D. L. M., Li, S. Y., Yang, Y. F., Jiang, M. Y., Ruan, Y., Su, Q., Ma, Y., & Chung, L. Y. F. (2020). Anxiety and depression of Nurses in a north West Province in China during the period of novel coronavirus pneumonia outbreak. *Journal of Nursing Scholarship*, *52*(5), 564–573. https://doi.org/10.1111/jnu.12590

He, Q., Li, T., Su, Y., & Luan, Y. (2021). Instructive messages and lessons from Chinese countermarching Nurses of caring for COVID-19 patients: A qualitative study. *Journal of Transcultural Nursing*, *32*(2), 96–102. https://doi.org/10.1177/1043659620950447

Heo, Y. M., Lee, M., & Jang, S. J. (2021). Intentions of frontline nurses regarding COVID-19 patient care: A cross-sectional study in Korea. *Journal of Nursing Management*. https://doi.org/10.1111/jonm.13333

Holloway, A., Thomson, A., Stilwell, B., Finch, H., Irwin, K., & Crisp, N. (2021). Agents of Change: the story of the Nursing Now campaign. https://yearofthenurseandmidwife.org/

Honey, M., & Wang, W. Y. (2013). New Zealand nurses perceptions of caring for patients with influenza a (H1N1). *Nursing in Critical Care*, *18*(2), 63–69. https://doi.org/10.1111/j.1478-5153.2012.00520.x

Hong, S., Ai, M., Xu, X., Wang, W., Chen, J., Zhang, Q., Wang, L., & Kuang, L. (2021). Immediate psychological impact on nurses working at 42 government-designated hospitals during COVID-19 outbreak in China: A cross-sectional study. *Nursing Outlook*, *69*(1), 6–12. https://doi.org/10.1016/j.outlook.2020.07.007

Hoseinabadi, T. S., Kakhki, S., Teimori, G., & Nayyeri, S. (2020). Burnout and its influencing factors between frontline nurses and nurses from other wards during the outbreak of coronavirus disease-COVID-19-in Iran. *Investigacion y Educacion En Enfermeria*, *38*(2). https://doi.org/10.17533/UDEA.IEE.V38N2E03

International Council of Nurses (ICN). (2020). Rising rate in COVID-19 infection amongst health workers requires urgent action. https://www.icn.ch/news/icn-tells-bbc-world-news-viewers-rising-rate-covid-19-infection-amongst-health-workers

International Council of Nurses (ICN). (2021). Policy brief, the global nursing shortage and nurse retention. https://www.icn.ch/sites/default/files/inline-files/ICN%20Policy%20Brief_Nurse%20Shortage%20and%20Retention.pdf

Jia, Y., Chen, O., Xiao, Z., Xiao, J., Bian, J., & Jia, H. (2021). Nurses' ethical challenges caring for people with COVID-19: A qualitative study. *Nursing Ethics*, *28*(1), 33–45. https://doi.org/10.1177/0969733020944453

JLGD, S., Balsanelli, A. P., Freitas, E. O., FHA, M., Carneiro, I. A., Lazzari, D. D., JAL, M., Erdmann, A. L., & Camponogara, S. (2021). Work environment of hospital nurses during the COVID-19 pandemic in Brazil. *International Nursing Review*, *402392*, 1–10. https://doi.org/10.1111/inr.12662

Jose, S., Cyriac, M. C., & Dhandapani, M. (2021). Health problems and skin damages caused by personal protective equipment: Experience of frontline Nurses caring for critical COVID-19 patients in intensive care units. *Indian Journal of Critical Care Medicine: Peer-Reviewed*, *Official Publication of Indian Society of Critical Care Medicine*, *25*(2), 134–139. https://doi.org/10.5005/jp-journals-10071-23713

Kackin, O., Ciydem, E., Aci, O. S., & Kutlu, F. Y. (2021). Experiences and psychosocial problems of nurses caring for patients diagnosed with COVID-19 in Turkey: A qualitative study. *The International Journal of Social Psychiatry*, *67*(2), 158–167. https://doi.org/10.1177/0020764020942788

Kalateh Sadati, A., Zarei, L., Shahabi, S., Heydari, S. T., Taheri, V., Jiriaei, R., Ebrahimzade, N., & Lankarani, K. B. (2021). Nursing experiences of COVID-19 outbreak in Iran: A qualitative study. *Nursing Open*, *8*(1), 72–79. https://doi.org/10.1002/nop2.604

Kang, H. S., Son, Y. D., Chae, S.-M., & Corte, C. (2018). Working experiences of nurses during the Middle East respiratory syndrome outbreak. *International Journal of Nursing Practice*, *24*(5), e12664. https://doi.org/10.1111/ijn.12664

Karimi, Z., Fereidouni, Z., Behnammoghadam, M., Alimohammadi, N., Mousavizadeh, A., Salehi, T., Mirzaee, M. S., & Mirzaee, S. (2020). The lived experience of nurses caring for patients with COVID-19 in Iran: A phenomenological study. *Risk Management and Healthcare Policy*, *13*, 1271–1278. https://doi.org/10.2147/RMHP.S258785

Kim, Y. (2018). Nurses' experiences of care for patients with Middle East respiratory syndrome-coronavirus in South Korea. *American Journal of Infection Control*, *46*(7), 781–787. https://doi.org/10.1016/j.ajic.2018.01.012

Koh, Y., Hegney, D. G., & Drury, V. (2011). Comprehensive systematic review of healthcare workers' perceptions of risk and use of coping strategies towards emerging respiratory infectious diseases. *International Journal of Evidence-Based Healthcare*, *9*(4), 403–419. https://doi.org/10.1111/J.1744-1609.2011.00242.X

Labrague, L. J., & de Los Santos, J. A. A. (2021). Fear of COVID-19, psychological distress, work satisfaction and turnover intention among

frontline nurses. *Journal of Nursing Management*, *29*(3), 395–403. https://doi.org/10.1111/jonm.13168

Lam, K. K., & Hung, S. Y. (2013). Perceptions of emergency nurses during the human swine influenza outbreak: A qualitative study. *International Emergency Nursing*, *21*(4), 240–246. https://doi.org/10.1016/j.ienj.2012.08.008

Lapum, J., Nguyen, M., Fredericks, S., Lai, S., & McShane, J. (2021). 'Goodbye … through a glass door': Emotional experiences of working in COVID-19 acute care hospital environments. *The Canadian Journal of Nursing Research*, *53*(1), 5–15. https://doi.org/10.1177/0844562120982420

Laudanski, K., Moon, K., Singh, A., Chen, Y., & Restrepo, M. (2021). The characterization of the toll of caring for coronavirus disease 2019 on ICU nursing staff. *Critical Care Explorations*, *3*(4), e0380. https://doi.org/10.1097/cce.0000000000000380

Lee, H. J., Kim, E., Morse, B. L., & Lee, S. E. (2021). Barriers and facilitators of Nurses' and Physicians' willingness to work during a respiratory disease outbreak: A mixed-methods systematic review. *International Journal of Environmental Research and Public Health*, *18*, 6841, 18(13), 6841 2021, Vol. Page. https://doi.org/10.3390/IJERPH18136841

Lee, J. Y., Hong, J. H., & Park, E. Y. (2020). Beyond the fear: Nurses' experiences caring for patients with Middle East respiratory syndrome: A phenomenological study. *Journal of Clinical Nursing*, *29*(17–18), 3349–3362. https://doi.org/10.1111/jocn.15366

Lee, N., & Lee, H. J. (2020). South korean nurses' experiences with patient care at a covid-19-designated hospital: Growth after the frontline battle against an infectious disease pandemic. *International Journal of Environmental Research and Public Health*, *17*(23), 1–22. https://doi.org/10.3390/ijerph17239015

Lee, S. H., Juang, Y. Y., Su, Y. J., Lee, H. L., Lin, Y. H., & Chao, C. C. (2005). Facing SARS: Psychological impacts on SARS team nurses and psychiatric services in a Taiwan general hospital. *General Hospital Psychiatry*, *27*(5), 352–358. https://doi.org/10.1016/j.genhosppsych.2005.04.007

Leventhal, H., Meyer, D., & Nerenz, D. (1980). The common sense representation of illness danger. *The Common Sense Representation of Illness Danger*, 17–30.

Leventhal, H., Phillips, L. A., & Burns, E. (2016). The common-sense model of self-regulation (CSM): Adynamic framework for understanding illness self-management. *Journal of Behavioral Medicine*, *39*, 935–946. https://doi.org/10.1007/s10865-016-9782-2

Li, X., Zhou, Y., & Xu, X. (2021). Factors associated with the psychological well-being among front-line nurses exposed to COVID-2019 in China: A predictive study. *Journal of Nursing Management*, *29*(2), 240–249. https://doi.org/10.1111/jonm.13146

Lim, J., Bogossian, F., & Ahern, K. (2010). Stress and coping in Australian nurses: A systematic review. *International Nursing Review*, *57*(1), 22–31. https://doi.org/10.1111/J.1466-7657.2009.00765.X

Liu, H., & Liehr, P. (2009). Instructive messages from Chinese nurses' stories of caring for SARS patients. *Journal of Clinical Nursing*, *18*(20), 2880–2887. https://doi.org/10.1111/j.1365-2702.2009.02857.x

Liu, Y. E., Zhai, Z. C., Han, Y. H., Liu, Y. L., Liu, F. P., & Hu, D. Y. (2020). Experiences of front-line nurses combating coronavirus disease-2019 in China: A qualitative analysis. *Public Health Nursing*, *37*(5). https://doi.org/10.1111/phn.12768

Lizarondo, L., Stern, C., Carrier, J., Godfrey, C., Rieger, K., Salmond, S., Apostolo, J., Kirkpatrick, P., & Loveday, H. (2020). *Chapter 8: Mixed methods systematic reviews*. In JBI Manual for Evidence Synthesis. https://doi.org/10.46658/jbimes-20-09

Logiudice, J. A., & Bartos, S. (2021). Experiences of Nurses during the COVID-19 pandemic: A mixed-methods study. *AACN Advanced Critical Care*, *32*(1). https://doi.org/10.4037/aacnacc2021816

Lyu, H., Yao, M., Zhang, D., & Liu, X. (2020). The relationship among organizational identity, psychological resilience and work engagement of the first-line nurses in the prevention and control of

COVID-19 based on structural equation model. *Risk Management and Healthcare Policy*, *13*, 2379–2386. https://doi.org/10.2147/RMHP.S254928

Madhav, N., Oppenheim, B., Gallivan, M., Mulembakani, P., Rubin, E., & Wolfe, N. (2017). Pandemics: Risks, impacts, and mitigation. In *Disease control priorities, third edition (volume 9): Improving health and reducing poverty* (pp. 315–345). The World Bank. https://doi.org/10.1596/978-1-4648-0527-1_ch17

Mathews Burwell, S., Townsend, F. F., Bollyky, T. J., & Patrick, S. M. (2020). *Improving pandemic preparedness lessons from COVID-19.*

Maunder, R. (2004). The experience of the 2003 SARS outbreak as a traumatic stress among frontline healthcare workers in Toronto: Lessons learned. In *Philosophical transactions of the Royal Society B: Biological sciences* (pp. 1117–1125). Royal Society. https://doi.org/10.1098/rstb.2004.1483

Moradi, Y., Baghaei, R., Hosseingholipour, K., & Mollazadeh, F. (2021). Protective reactions of ICU nurses providing care for patients with COVID-19: A qualitative study. *BMC Nursing*, *20*, 1–6. https://doi.org/10.1186/s12912-021-00567-6

Mousavizadeh Merdasi, P. G., & Safari, M. (2021). Psychological Challenges of Nurses in Pandemic Covid-19. *Phychology And Education Journal*, *15*(1), 448–455.

Murat, M., Köse, S., & Savaşer, S. (2021). Determination of stress, depression and burnout levels of front-line nurses during the COVID-19 pandemic. *International Journal of Mental Health Nursing*, *30*(2), 533–543. https://doi.org/10.1111/inm.12818

Muz, G., & Erdoğan Yüce, G. (2020). Experiences of nurses caring for patients with COVID-19 in Turkey: A phenomenological enquiry. *Journal of Nursing Management, December, 2020*, 1–10. https://doi.org/10.1111/jonm.13240

Ohta, R., Matsuzaki, Y., & Itamochi, S. (2020). Overcoming the challenge of COVID-19: A grounded theory approach to rural nurses' experiences. *Journal of General and Family Medicine, November, 2020*, 134–140. https://doi.org/10.1002/jgf2.410

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *PLoS Medicine*, *18*(3), e1003583. https://doi.org/10.1371/journal.pmed.1003583

Park, J.-S. S., Lee, E.-H. H., Park, N.-R. R., & Choi, Y. H. (2018). Mental health of Nurses working at a government-designated hospital during a MERS-CoV outbreak: A cross-sectional study. *Archives of Psychiatric Nursing*, *32*(1), 2–6. https://doi.org/10.1016/j.apnu.2017.09.006

Pasay-an, E. (2020). Exploring the vulnerability of frontline nurses to COVID-19 and its impact on perceived stress. *Journal of Taibah University Medical Sciences*, *15*(5), 404–409. https://doi.org/10.1016/j.jtumed.2020.07.003

Pourteimour, S., Yaghmaei, S., & Babamohamadi, H. (2020). The relationship between mental workload and job performance among Iranian nurses providing care to COVID-19 patients: A cross-sectional study. *Journal of Nursing Management, December, 2021*, 1–10. https://doi.org/10.1111/jonm.13305

Rezaee, N., Mardani-Hamooleh, M., & Seraji, M. (2020). Nurses' perception of ethical challenges in caring for patients with covid-19: A qualitative analysis. *Journal of Medical Ethics and History of Medicine*, *13*(23), 1–13. https://doi.org/10.18502/jmehm.v13i23.4954

Robinson, R., & Kellam Stinson, C. (2021). The lived experiences of Nurses working during the COVID-19 pandemic. *Dimensions of Critical Care Nursing*, *40*(3), 156–163. https://doi.org/10.1097/dcc.0000000000000481

Rozwaha, T., Fletcher, I., Giga, S., & Highfield, J. (2020). A systematic review and thematic synthesis of nurse experiences during emerging infectious disease epidemics. http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42020177331

Sagherian, K., Steege, L. M., Cobb, S. J., & Cho, H. (2020). Insomnia, fatigue and psychosocial well-being during COVID-19 pandemic: A cross-sectional survey of hospital nursing staff in the United States. *Journal of Clinical Nursing*, 1–14. https://doi.org/10.1111/jocn.15566

Saragih, I. D., Tonapa, S. I., Saragih, I. S., Advani, S., Batubara, S. O., Suarilah, I., & Lin, C. J. (2021). Global prevalence of mental health problems among healthcare workers during the Covid-19 pandemic: A systematic review and meta-analysis. *International Journal of Nursing Studies*, *121*, 104002. https://doi.org/10.1016/j.ijnurstu.2021.104002

Schroeder, K., Norful, A. A., Travers, J., & Aliyu, S. (2020). Nursing perspectives on care delivery during the early stages of the covid-19 pandemic: A qualitative study. *International Journal of Nursing Studies Advances*, *2*, 100006. https://doi.org/10.1016/j.ijnsa.2020.100006

Seale, H., Leask, J., Po, K., & MacIntyre, C. R. (2009). "will they just pack up and leave?" – attitudes and intended behaviour of hospital health care workers during an influenza pandemic. *BMC Health Services Research*, *9*, 30. https://doi.org/10.1186/1472-6963-9-30

Sheng, Q., Zhang, X., Wang, X., & Cai, C. (2020). The influence of experiences of involvement in the COVID-19 rescue task on the professional identity among Chinese nurses: A qualitative study. *Journal of Nursing Management*, *28*(7), 1662–1669. https://doi.org/10.1111/jonm.13122

Shih, F.-J., Turale, S., Lin, Y.-S., Gau, M.-L., Kao, C.-C., Yang, C.-Y., & Liao, Y.-C. (2009). Surviving a life-threatening crisis: Taiwan's nurse leaders' reflections and difficulties fighting the SARS epidemic. *Journal of Clinical Nursing*, *18*(24), 3391–3400. https://doi.org/10.1111/j.1365-2702.2008.02521.x

Shih, F.-J., Gau, M.-L., Kao, C.-C., Yang, C.-Y., Lin, Y.-S., Liao, Y.-C., & Sheu, S.-J. (2007). Dying and caring on the edge: Taiwan's surviving nurses' reflections on taking care of patients with severe acute respiratory syndrome. *Applied Nursing Research*, *20*(4), 171–180.

Su, T.-P. P., Lien, T.-C. C., Yang, C.-Y. Y., Su, Y. L., Wang, J.-H. H., Tsai, S.-L. L., & Yin, J.-C. C. (2007). Prevalence of psychiatric morbidity and psychological adaptation of the nurses in a structured SARS caring unit during outbreak: A prospective and periodic assessment study in Taiwan. *Journal of Psychiatric Research*, *41*(1–2), 119–130. https://doi.org/10.1016/j.jpsychires.2005.12.006

Sun, N., Wei, L., Shi, S., Jiao, D., Song, R., Ma, L., Wang, H., Wang, C., Wang, Z., You, Y., Liu, S., & Wang, H. (2020). A qualitative study on the psychological experience of caregivers of COVID-19 patients. *American Journal of Infection Control*, *48*(6), 592–598. https://doi.org/10.1016/j.ajic.2020.03.018

Tan, R., Yu, T., Luo, K., Teng, F., Liu, Y., Luo, J., & Hu, D. (2020). Experiences of clinical first-line nurses treating patients with COVID-19: A qualitative study. *Journal of Nursing Management*, *28*(6), 1381–1390. https://doi.org/10.1111/jonm.13095

Vitale, E., Galatola, V., & Mea, R. (2021). Observational study on the potential psychological factors that affected Italian nurses involved in the COVID-19 health emergency. *Acta Bio-Medica: Atenei Parmensis*, *92*(S2), e2021007. https://doi.org/10.23750/abm.v92iS2.11305

Vizheh, M., Qorbani, M., Arzaghi, S. M., Muhidin, S., Javanmard, Z., & Esmaeili, M. (2020). The mental health of healthcare workers in the COVID-19 pandemic: A systematic review. *In Journal of Diabetes and Metabolic Disorders. Springer Science and Business Media Deutschland GmbH.*https://doi.org/10.1007/s40200-020-00643-9

Wang, Q., Fan, J. Y., Zhao, H. M., Liu, Y. T., Xi, X. X., Kong, L. L., Li, J., & Mao, J. (2021). A large scale of Nurses participated in beating down COVID-19 in China: The physical and psychological distress. *Current Medical Science*, *41*(1), 31–38. https://doi.org/10.1007/s11596-021-2314-5

West, M., Bailey, S., & Williams, E. (2020). The courage of compassion. www.kingsfund.org.uk

World Health Organization (WHO). (2010). Past pandemics. Past pandemics (who.int).

World Health Organization (WHO). (2016a). Influenza (seasonal). https://www.who.int/news-room/fact-sheets/detail/influenza-(seasonal)

World Health Organization (WHO). (2016b). *Global strategic directions for strengthening nursing and midwifery 2016–2020.* https://www.who.int/hrh/nursing_midwifery/global-strategic-midwifery2016-2020.pdf

World Health Organization (WHO). (2017). WHO Guidance for Surveillance during an Influenza Pandemic.

World Health Organization (WHO). (2020). Origin of SARS-CoV-2. https://apps.who.int/iris/bitstream/handle/10665/332197/WHO-2019-nCoV-FAQ-Virus_origin-2020.1-eng.pdf

World Health Organization (WHO). (2021). The impact of COVID-19 on health and care workers: a closer look at deaths. https://apps.who.int/iris/bitstream/handle/10665/345300/WHO-HWF-WorkingPaper-2021.1-eng.pdf?sequence=1&isAllowed=y

World Health Organization (WHO). (2022). WHO Coronavirus (COVID-19) Dashboard. https://covid19.who.int

Xu, S., Yang, Q., Xie, M., Wang, J., Shan, A., & Shi, F. (2021). Work experience of triage nurses in emergency departments during the prevalence of COVID-19. *International Emergency Nursing*, *56.* https://doi.org/10.1016/j.ienj.2021.101003

Yildirim, N., Bulut, M., & Aydogan Nazmiye, A. A. O.-Y. (2021). A qualitative study on the experiences of the first nurses assigned to COVID-19 units in Turkey. *Journal of Nursing Management.* https://doi.org/10.1111/jonm.13291

Zhan, Y., Ma, S., Jian, X., Cao, Y., & Zhan, X. (2020). The current situation and influencing factors of job stress among frontline Nurses assisting in Wuhan in fighting COVID-19. *Frontiers in Public Health*, *8.* https://doi.org/10.3389/fpubh.2020.579866

Zhang, Y., Wang, C., Pan, W., Zheng, J., Cai, S., Gao, J., Huang, X., Zhai, Y., Latour, J. M., & Zhu, C. (2020). Stress, burnout, and coping strategies of frontline Nurses during the COVID-19 epidemic in Wuhan and Shanghai. *China. Frontiers in Psychiatry*, *11*, 565520. https://doi.org/10.3389/fpsyt.2020.565520

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.