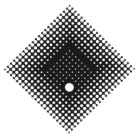
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Exploring the experiences of frontline nurses during the first 6 months of the COVID-19 pandemic: an integrated literature review

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SYSTEMATIC REVIEW

Exploring the experiences of frontline nurses during the first 6 months of the COVID-19 pandemic: An integrated literature review

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Abstract

Aim: The aim of this study was to explore the experiences of frontline nurses caring for patients during the first 6 months of the COVID-19 pandemic.

Design: The JBI manual for evidence synthesis and the PRISMA guidelines for reporting.

Data sources: CINAHL Complete, MEDLINE, PsycINFO (EBSCO) and Scopus (Elsevier).

Review Methods: The JBI Mixed Methods Data Extraction Tool following a Convergent Integrated Approach.

Results: Nineteen studies were included in the review, comprising eight countries and 2525 frontline nurses. Six themes emerged encompassing frontline nurses' COVID-19 experiences including emotional experiences, physical symptoms, ethical and moral challenges, professional impact, risk factors for negative emotional experiences and protective factors for future pandemic events.

Conclusion: Frontline nurses have faced numerous challenges during the COVID-19 pandemic. Providing frontline nurses with the required resources and support to perform their roles in global healthcare crises allows for an empowered and resilient workforce ensuring nurses remain in their chosen profession.

KEYWORDS
Covid-19, emergency, integrative review, lived experience, nursing, pandemic

1 | INTRODUCTION

The year 2020 was an extraordinary and unprecedented year in health care and medicine. The World Health Organisation (WHO) declared coronavirus disease 2019 (COVID-19) a pandemic on 11 March 2020, which enveloped the globe at such a pace; many countries did not have the capacity, resources or resolve to manage the steep increase in daily cases and deaths (World Health Organisation, 2021).

The WHO had estimated that between January 2020 and May 2021, approximately 115,500 healthcare workers had died due to COVID-19 (World Health Organisation, 2021). The daily distress effects have seen the development of posttraumatic stress disorder-like symptoms in many frontline nurses (Foli et al., 2021), with the prediction of a mass exodus of nurses experiencing the psychological impacts the pandemic has caused (International Council of Nurses, 2021). Nurses globally have risen to the daily challenges and demands of the pandemic, which is still evolving. A systematic

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review of the literature was conducted to obtain a global perspective on the experiences of frontline nurses caring for patients during the first 6 months of the COVID-19 pandemic. This review aims to inform future practice and allow for modelling and assessment for future disease outbreaks.

2 | BACKGROUND

Coronavirus disease 2019, formally named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first notified to the WHO in December 2019 (Cheng & Williamson, 2020; World Health Organisation, 2021). The first cases reported to the WHO were detected in Wuhan, China, as a pneumonia of unknown aetiology, with formal gene sequencing confirming the novel coronavirus in January 2020 (Wang et al., 2020). COVID-19 cases presented with fever, cough and myalgia, with most severe patients dying of severe pneumonia, respiratory and multi-organ failure (Wang et al., 2020). At the close of 2020, there were 82,659,573 cases and 1,872,945 deaths from COVID-19 recorded globally (World Health Organisation, 2021).

The year 2020 was the International Year of the Nurse (World Health Organisation, 2021), a campaign to help recognize the critical work of nurses and midwives to improve the health of populations. The campaign highlighted the importance of nurses globally, emphasizing the often challenging circumstances of their work, frequently performed with limited resources (World Health Organisation, 2021). Those at the forefront of the COVID-19 pandemic were predominately nurses, specifically those working in emergency departments, community temporary hospitals and intensive care departments (Hennekam et al., 2020; Whetzel et al., 2013). A crucial part of being a frontline nurse is the requirement to make fast and accurate decisions for their patients with limited background information in order to achieve the best possible health outcome (Richardson, 2016). This ability to appropriately and immediately act has been challenged during the COVID-19 pandemic, with decisions often made with limited resources, with nursing staff physically and mental fatigued, and with the increased risk of illness or death to the frontline worker (Maguen & Price, 2020). Higher and unsustainable levels of burnout among frontline nurses have been identified globally, with the expectation that these levels may rise further with the changing landscape of COVID-19 (Almubark et al., 2020). In previous outbreaks, such as the 2003 severe acute respiratory syndrome (SARS) outbreak and the 2014 Middle East Respiratory Syndrome coronavirus (MERS-CoV) outbreak, frontline workers experienced physical and psychological impacts (Chan et al., 2005; Khalid et al., 2016). Heavy workloads, a constant influx of infected patients, the highly infectious nature of the virus, poor hospital resources and rapidly changing policies and procedures were the main sources of stress and burnout (Chan et al., 2005; Kim & Choi, 2016).

These mental and physical effects of virus outbreak environments have been expressed by frontline nurses during the COVID-19 pandemic, describing the work as rewarding, yet intensely traumatic (Bennett et al., 2020). Fear of self-infection and infecting family and friends, feelings of inadequacy, stigma, isolation and inadequate support and personal protective equipment supplied from organizations are just some of the concerns voiced by frontline workers during the COVID-19 pandemic (Bennett et al., 2020; Rathore et al., 2020; Zolnikov & Furio, 2020). There are limited reviews of current published literature exploring exclusively the frontline nurses' experience during the first 6 months of the COVID-19, potentially due to the novelty and rapidly changing nature of this pandemic. A qualitative systematic review was undertaken by Xu et al. (2021), outlining the psychosocial experiences of frontline nurses during the first 22 years of the COVID-19 pandemic. The review focussed on the mental health and emotional elements of the "frontline" nurse experience, without specification of work-related background. Whilst this integrative review explores the mental health and emotional elements of the experience, the review explores the broader lived experience, encompassing a holistic appreciation of the phenomena and its influence on the lives of frontline workers. Lifeworld understandings, attitudes, biases, reflections and perceptions whilst working on the healthcare front line were all encompassed in our review, with a narrower focus of the first 6 months of the COVID-19 pandemic. Work-related background and work position was collected, purposefully demonstrating the emotions and reactions of staff directly in contact with COVID-19 patients during this critical period of global unrest. With a steep increase in studies published daily, it is vital to explore and collate evidence on the effects the pandemic has had on frontline workers.

3 | THE REVIEW

3.1 | Aim

This review aims to examine and synthesize the experiences of frontline nurses caring for patients during the first 6 months of the COVID-19 pandemic.

3.2 | Design

This review was guided by the Joanna Briggs Institute (JBI) manual for evidence synthesis and the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines for reporting (Aromataris & Munn, 2020; Page et al., 2021).

3.3 | Search methods

Electronic databases CINAHL Complete, MEDLINE, PsycINFO (EBSCO) and Scopus (Elsevier) were searched for relevant papers. Final date of accepted papers was the 31 July 2021. The search terms used included TITLE-ABS-KEY (nurs*) AND (attitude* OR perception* OR emotion* OR feeling* OR thought*) AND (pandemic*

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OR epidemic* OR covid* OR coronavirus). Studies included were academic journals that had been peer-reviewed between 2020–2021. Papers were refined by the English language, ensuring full text was available and human research only. Papers that collected data between January and June 2020 were included. Papers reporting on the experiences of COVID-19 frontline nurses were included, excluding papers on logistics, paediatric populations and other healthcare workers.

3.4 | Search outcome

A total of 124 papers were selected after the initial database searches (Figure 1). Duplicate and incomplete sources (9) were removed, with literature reviews (5) and commentaries (9) also being removed. On review of abstract appropriateness, an additional 13 papers were removed leaving 88 papers considered after the identification process. During the screening phase, the inclusion of nurse-only papers was applied, removing 45 papers. Title and abstract appropriateness sorting was applied, removing papers that focussed on pandemic preparedness (2), contextual and logistical factors (5), and were not specific to the research question (7), leaving 29 papers to be assessed for eligibility. During assessment for eligibility, the authors excluded papers of paediatric populations (2), non-COVID-19 specific pandemics and epidemics (4) and that were not specific to the research question (3). One additional paper was excluded postcritical appraisal that did not address the research question. A total of 19 papers were included in the final review, with quantitative (6), qualitative (12) and mixed-methods (1) papers being included. The rationale for including papers of varying methodology stemmed from the limited number of papers on the topic of responses of frontline nurses during COVID-19. Meta-analysis and meta-synthesis were not appropriate for this review, as including varied methodologies allowed for

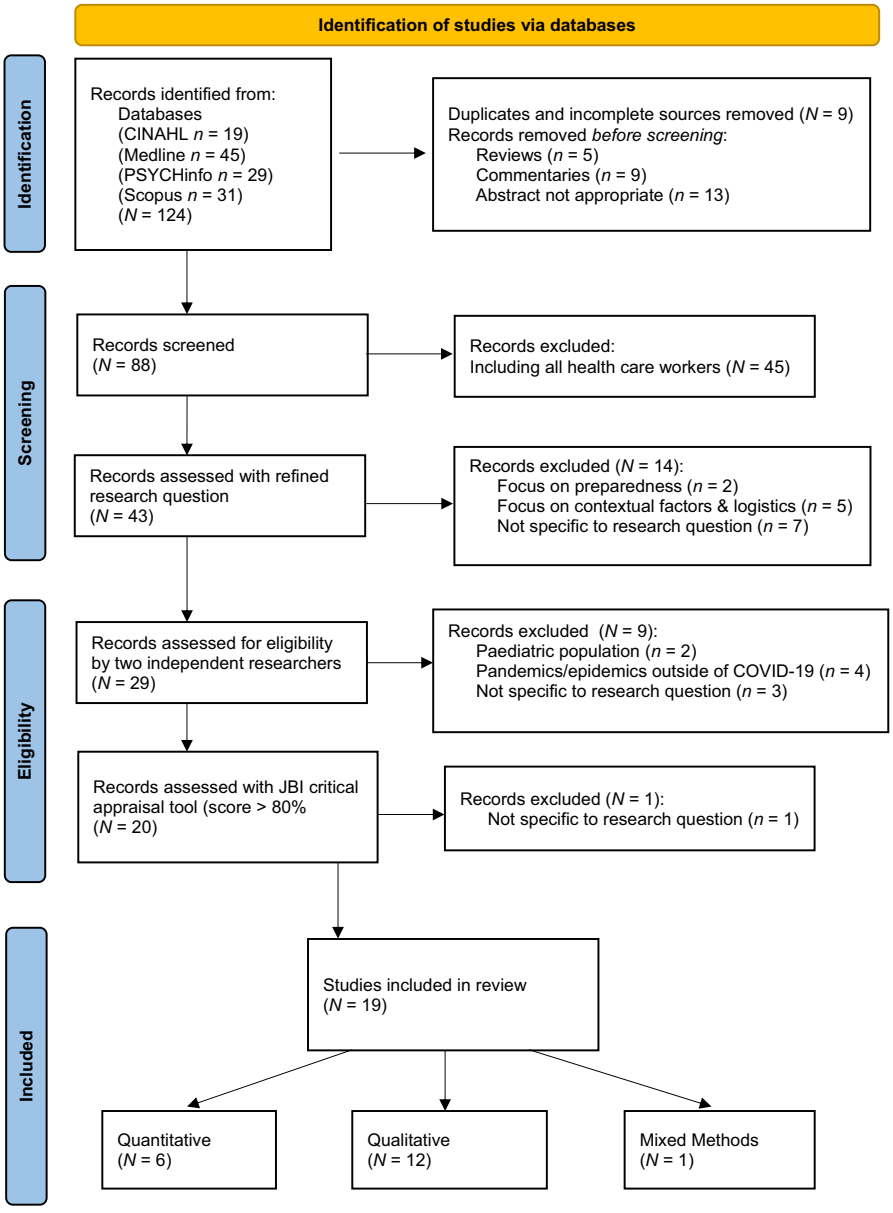

FIGURE 1 PRISMA flow diagram Page et al. (2021)

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a more robust understanding of the current literature, and helped determine how different countries with varied exposure to the COVID-19 pandemic experienced frontline work.

3.5 | Quality appraisal

Papers were assessed for quality and rigour using the Joanna Briggs Critical Appraisal tool, requiring a score > 80% to be included in the final review. Tools appropriate for each study methodology were utilized, including the checklist for cross-sectional studies and the checklist for qualitative studies, where each criterion is given a score (Yes, No, Unclear or Not Applicable). All six quantitative studies were of the highest quality, scoring 100% on an 8-item scale (Ali et al., 2020; Bruyneel et al., 2021; Franco Coffré & Leví Aguirre, 2020; González-Gil et al., 2021; Labrague & de Los Santos, 2021; Leng et al., 2021). The 12 qualitative and one mixed-methods paper had critical appraisal scores ranging from 80%–100% on a 10-item scale. Approximately 50% of these papers stated a philosophical perspective (Deliktas Demirci et al., 2021; García-Martín et al., 2021; LoGiudice & Bartos, 2021; Mohammadi et al., 2021; Robinson & Stinson, 2021; Sadang, 2021; Tan et al., 2020). Only 15% of the papers included a statement locating the researchers culturally or theoretically (Robinson & Stinson, 2021; Tan et al., 2020), and 40% did not state the influence of the researcher on the research and vice versa (García-Martín et al., 2021; Gordon et al., 2021; Jia et al., 2021; Monjazebi et al., 2021; Zhang et al., 2020).

3.6 | Data abstraction

As there was a mixture of quantitative, qualitative and mixed-methods papers answering the single research question in this review, a convergent integrated approach as per the JBI methodology for mixed-methods systematic reviews was utilized to ensure organized findings irrespective of methodology (Lizarondo et al., 2020). The data extracted included specific details about the study origins, period of data collection with corresponding COVID-19 caseloads at that time, study methods, population characteristics, phenomena of interest, settings, and context. Additional extracted detail included outcomes of findings (themes/subthemes) with corresponding illustrations, which were assigned a level of credibility (unequivocal, credible, not supported), with unsupported illustrations not included in the final review (Lockwood et al., 2020).

3.7 | Synthesis

Quantitative data were "qualitized" by converting quantitative results into textual descriptions. This facilitated integration of quantitative data with the qualitative quote illustrations, ensuring the diverse methodologies adequately answered the research question (Lizarondo et al., 2020). Once illustrations were assembled, data were collated by similarity and categorized into themes and subthemes to present a set of integrated findings.

4 | RESULTS

4.1 | Study characteristics

A total of 19 studies were selected (Table 1), with all studies published between 2020–2021, and 70% of papers published in 2021. The studies were conducted in eight different countries including China (5), the United States of America (4), Iran (3), Spain (2), the Philippines (2), Turkey (1), Belgium (1) and Ecuador (1), respectively. Studies were conducted from January to June 2020, the total COVID-19 cases and deaths during the studies data collection period were calculated by the lead author to provide a context of the potential load on front-line workers during this time. The lowest country COVID-19 case and death numbers reported during the data collection period were 150 cases in China; however, the deaths were not reported (Leng et al., 2021). The highest reported were in the United States with 1,577,565 cases and 64,382 deaths during the data collection period (LoGiudice & Bartos, 2021).

4.1.1 | Participants

A total of 2525 nurses were included in this review with a range of clinical backgrounds including emergency department (ED; 238), intensive care unit/critical care unit (ICU/CCU; 1557), pandemic/isolation ward (41), community quarantine facility (12), medical-surgical ward (37), general ward (348) nurse managers (62), other (155) and unspecified (71). All nurses had contact with COVID-19-infected patients.

4.1.2 | Setting

Of the 19 studies, participants were sampled from several clinical settings. Eight of the studies took place in a hospital setting (Ali et al., 2020; Franco Coffré & Leví Aguirre, 2020; García-Martín et al., 2021; Gordon et al., 2021; Jia et al., 2021; Liu et al., 2020; LoGiudice & Bartos, 2021; Robinson & Stinson, 2021), with three studies conducted in the public hospital sector (Deliktas Demirci et al., 2021; González-Gil et al., 2021; Labrague & de Los Santos, 2021). In addition, six studies took place in hospitals affiliated with Universities (Galehdar et al., 2020; Leng et al., 2021; Mohammadi et al., 2021; Monjazebi et al., 2021; Tan et al., 2020; Zhang et al., 2020). One study stated a mix of both public and private hospital settings (Labrague & de Los Santos, 2021) and one community quarantine facility setting (Sadang, 2021). Two studies stated settings including inpatient and outpatient settings, including medical centres (Bruyneel et al., 2021; LoGiudice & Bartos, 2021).

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TABLE 1 Descriptions of included studies by country of origin

Citation	Country	Data collection period and case average[a]	Research aims	Study design and population	Data analysis	JBI CA score[a]	Limitations	Key findings
Bruyneel et al. (2021)	Belgium	21 April – 4 May 2020 10,284 cases, 2103 deaths	To assess the prevalence of burnout risk and identify risk factors among ICU nurses during the COVID-19 pandemic.	Quantitative Web-based questionnaire *N* = 1135 ICU nurses	French version of the validated Maslach Burnout Inventory (MBI) scale Statistical analysis Descriptive, univariant and multivariate logistic linear regression models were preformed	100%	Potential selection bias, lack of inclusion and exclusion criteria for sample Ethical approval not required for online surveys under Belgian law	A total of 68% of ICU nurses at risk of burnout during the first wave of the COVID-19 outbreak. Negative dimension of burnout: emotional exhaustion, reduced personal accomplishment and depersonalization. Risk factors for burnout were a high ratio of patients per nurse, a perceived increase in workload, having symptoms of COVID-19 without being tested, and shortage of PPE
Jia et al. (2021)	China	February – March 2020 33,242 cases, deaths not reported	To examine the ethical challenges encountered by nurses caring for COVID-19 patients and share their coping styles to ethical dilemmas	Qualitative Descriptive design Structured in-depth video and phone interviews Purposive sampling *N* = 18 nurses (two outpatient) (eight internal medicine) (three surgical) (two ED) (three ICU)	Inductive content analysis performed by two separate researchers	80%	Sample from single healthcare centre Body language could not be obtained in phone call interviews Potential selection bias with participants chosen by nurse "ward leaders"	Ethical challenges for nurses: neglected patient rights, lack of emotional support for patients with no access to family Inequality: unequal exposure to virus, role ambiguity between doctor and nurse Professional ethics: PPE urgency, low sense of responsibility to patient outcomes Job competency: lack of knowledge and skills, heavy pressure on nurses Seeking support: family and friends, hobbies Impacts on career: specialized and management skills, research abilities
Leng et al. (2021)	China	11 March – 18 March 2020 150 cases, deaths not reported	To quantify the severity of nurses' PTSD symptoms and stress and explore influencing factors of psychological health when caring for COVID patients	Quantitative Cross-sectional design Survey using Questionnaire Star' with two open-ended questions *N* = 90 ICU nurses	SPSS version 23.0 Descriptive statistics for demographics Pearson correlation Thematic analysis for open-ended responses	100%	Selection bias: selection of elite nurses may skew results and underreporting. Nurses excluded if presenting with psychological issues prior to study Data collection only 5 weeks postoutbreak, may not be long enough to determine PTSD symptoms	ED nurses had lowest PTSD scores As age increased, nurses stress scores increased Fear of PPE shortages Feelings of isolation and psychological loneliness Cultural shock from deployment and fear for family safety Teamwork and managerial support increased feelings of safety and social recognition

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TABLE 1 (Continued)

Liu et al. (2020)	China	26 January – 5 February 2020 No case number data	To explore the experiences of front-line nurses combating COVID-19	Qualitative Semi-structured individual face-to-face interviews *N* = 15 nurses (six general wards) (seven ICU) (two infectious wards)	Qualitative methods: coding with themes by 2 researchers Member checking	90%	No limitations reported by researchers No statement on how sample was recruited from two hospitals	New challenges: learning new specialized skills Inevitable fear, fear of infection, PPE Exhaustion, physical symptoms of wearing PPE, no breaks for water Stress from rapid changes, no vaccine, deterioration of patients Sense of responsibility and identity: Communist party and military members Recognition, hope, confidence to overcome pandemic
Tan et al. (2020)	China	January – February 2020 31,512 cases, deaths not reported	To explore the work experience of clinical first-line nurses treating patients with coronavirus disease 2019 (COVID-19).	Qualitative Phenomenology Face-to-face, semi-structured phone and video interviews Purposive and snowball sampling *N* = 30 nurses (ward nurses, specialist nurses and nurse managers)	Content analysis	100%	Researcher A was working on the front line with the participants – performed the face-to-face interviews Phone interviews reduce ability to document non-verbal cues Single-site data collection Very broad mixture of education and experience levels among the nurses interviewed	Negative experiences: heavy workload, fear and anxiety, helplessness and frustration, empathy and compassion, unfamiliarity Difficulties faced: lack of knowledge and experience Identified needs: specialized knowledge, proper scheduling, psychological counselling Impact of work on attitudes: improved professional responsibility, promotion of professional identity
Zhang et al. (2020)	China	9 February – 15 March 2020 32,548 cases, deaths not reported	To identify the psychological change process of RNs who worked at epicentre of COVID-19 outbreak	Qualitative Descriptive study with purposive sampling Semi-structured interviews over "WeChat" video *N* = 23 COVID-19 isolation unit nurses	Colaizzi's method	80%	Recall bias when looking at multi-stage effects, nurses were interviewed in energy renewal phase Lack of detail on ethical approval specifics	Early stage: ambivalence, being torn between duty and fear of infection. Excited and proud to serve, however fearful of contagion, nurse death and the unknown Middle stage: emotional exhaustion, challenges of isolation, PPE, fear of infection. Feelings of depression, obsession, physical pain. Patient non-compliance and aggression Later stage: energy renewal, psychological adaptation, no longer as nervous, appreciation and support
Franco Coffré and Leví Aguirre (2020)	Ecuador	March – May 2020 42,153 cases, 3356 deaths	To explore feelings, stress factors and adaptation strategies of nurses during the COVID-19 outbreak in Guayaquil, Ecuador	Quantitative Descriptive, cross-sectional study with survey by "Survey Monkey" Convenience sampling *N* = 127 nurses (42 ED) (37 hospitalizations) (36 ICU) (12 other)	Descriptive statistics SPSS version 25	100%	Sample from a single hospital Memory bias with surveys completed postsevere height of pandemic in Ecuador	Stress factors: being infected or infecting family, lack of treatment or vaccine and lack of PPE Stress reduction: positive attitude, teamwork, recovery of patients, good health of family/friends Coping strategies: following strict hygiene protocol, social distancing, education

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TABLE 1 (Continued)

Galehdar et al. (2020)	Iran	March – May 2020 150,872 cases, 7754 deaths	This study aimed to explore nurses' experiences of psychological distress during care of patients with COVID-19.	Qualitative Purposeful sampling Semi-structured in-depth phone interviews *N* = 20 nurses (6 ED) (11 ICU/CCU) (two general) (one infectious ward)	Graneheim and Lundman's content analysis approach Member checking	90%	Interviews conducted over the phone Short period of data collection Interview question encouraged discussion of only "unpleasant experiences"	Death anxiety: inductive death, mortality rate, nurses inability to help patients Anxiety due to nature of disease: disease severity, disease's unknown dimensions, corpse burial Fear of infecting the family, contamination and wearing PPE Emotional distress for delivery bad news Public ignorance of preventive measures
Mohammadi et al. (2021)	Iran	February – May 2020 151,370 cases, 7781 deaths	To describe the caregivers' experiences of the caring challenges in patients with COVID-19	Qualitative Phenomenological descriptive design Purposive sampling Semi-structured, single video interviews *N* = 23 nurses	Colaizzi's method Member checking	90%	Limited access to nurses and ability to perform face-to-face interviews Only individual interviews, lack of field notes and observation	Psychological tension: stress at work, terror and anxiety, depression Inefficient management: lack of present action plans, lack of preparation drills, inadequate supply of services, equipment and facilities, poor public information Contextual factors: severity, type and rate of transmission, opportunism
Monjazebi et al. (2021)	Iran	20 February – 23 April 2020 86,931 cases, 5465 deaths	To explore nurses' experiences in caring for COVID-19 patients	Qualitative Purposeful sampling Phone interviews and five field notes *N* = 18 nurses (two ED) (five ICU) (11 internal/pulmonology)	Content analysis Member checking	80%	No limitations listed Unclear who wrote field notes and what effect they had on results	Security in care giving: occupational security, fear of infection, PPE Healing hands, empty hands: lack of certainty, increased workload Multiple feelings: ethical hero, fear and hope
Labrague and de Los Santos (2021)	Philippines	March – May 2020 18,012 cases, 954 deaths	To examine the relative influence of fear of COVID-19 on nurses' psychological distress, work satisfaction and intent to leave their organization and the profession	Quantitative Cross-sectional design survey *N* = 261 nurses (199 staff nurses) (62 nurse managers)	SPSS version 23 Pearson correlation Multiple linear regression analysis	100%	Study conducted in one province of the Philippines Additional factors not included in The Fear of COVID-19 Scale may impact nurses' fear	Nurses who attended training experienced decreased fear An increased level of fear of COVID-19 was associated with decreased job satisfaction, increased psychological distress and increased organizational and professional turnover intentions
Sadang (2021)	Philippines	No date of data collection stated, therefore no case and death statistics available	To explore the meaning of Filipino nurses' work in frontline community quarantine facilities amidst COVID-19	Qualitative Descriptive phenomenological inquiry Purposive and snowball sampling Face-to-face in-depth interviews *N* = 12 community quarantine facility nurses	Colaizzi's method	90%	Sample from single community quarantine facility Short time frame for data collection due to health practicalities No documented timeframe for data collection period	Work as self-sacrifice: lack of PPE, high volumes of patients, working overtime Opportunity to work and serve, calling of duty and profession Work as psychological struggle: stigma, challenging patients, for example violence, lack of compliance

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TABLE 1 (Continued)

García-Martín et al. (2021)	Spain	February – April 2020 223,385 cases, 24,533 deaths	To explore the experiences and perceptions of recent nursing graduates working in emergency departments during the COVID-19 outbreak.	Qualitative Semi-structured face-to-face interviews Convenience and snowball sampling Heidegger's phenomenological hermeneutical approach *N* = 16 graduate ED nurses	Colaizzi's method	80%	Pioneer study, making discussion difficult with minimal comparative studies	Fears and concerns: coping with stress and uncertainty, anxiety for being a burden on colleagues, fear of infecting loved ones and others Organizational issues: lack of beds, high level of burnout, dealing with new challenges, ever-changing protocols, PPE, quarantined professionals Support for novice nurses: scarce information and resources, better planning and formation, lack of shadowing periods
González-Gil et al. (2021)	Spain	1 April – 15 April 2020 81,721 cases, 10,244 deaths	To identify needs related to safety, organization, decision-making, communication and psychosocial-emotional needs perceived by critical care and emergency nurses in the region of Madrid, Spain, during the acute phase of the epidemic crisis.	Quantitative Non-probability sampling method Cross-sectional design with online questionnaire by "SurveyMonkey" *N* = 557 nurses (169 ED) (205 CCU) (71 inpatient care) (108 Other) (four Missing)	Descriptive analysis measuring absolute and relative frequencies	100%	Questionnaires adapted to a Spanish context Questionnaires with missing data included Intentional sampling	Fear of becoming infected and afraid of infecting others Elevated workloads, high patient–nurse ratios and shifts that did not allow them to disconnect or rest Emotional exhaustion, more responsibilities when managing patients with COVID-19
Deliktas Demirci et al. (2021)	Turkey	June 2020 35,964 cases, 591 deaths	To explore the experiences and coping strategies of Turkish nurses working in COVID-19 pandemic units	Qualitative Grounded theory Purposive and theoretical sampling In-depth telephone interviews *N* = 15 pandemic ward nurses	Constant comparative method: open, axial and selective coding	90%	Largely female participants Sample from single healthcare centre	Emotional responses: fear, shock, anxiety, media portrayal of COVID-19, exclusion Feeling like a hero, increased social status, nursing as a sacred profession Incomplete care: ethical dilemmas, not involved in decision-making Adapting to new conditions, learning process
Ali et al. (2020)	United States	19 May – 6 June 2020 419,225 cases, 19,678 deaths	To investigate the major stressors and coping strategies reported by nurses caring for COVID patients working in the state of Alabama, United States	Quantitative Cross-sectional design Qualtrics survey distributed on LinkedIn *N* = 109 nurses (33 general nurses) (31 ICU) (19 theatres) (12 ED) (14 other)	Minitab 19 Descriptive statistics Multiple linear regression analysis Chi-squared test	100%	Sample mainly from 2 dominant hospitals Findings may not be generalized to other hypotheses	Fatigue, anxiety and burnout Workload stress and caring for infected patient stress Scared of infection and infecting family and friends Senior nurses = decreased stress levels A total of 52% considered leaving job due to COVID

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TABLE 1 (Continued)

Gordon et al. (2021)	United States	No date of data collection stated, therefore no case and death statistics available	To examine the experiences of United States ICU nurses caring for patients with COVID-19	Qualitative Descriptive design Purposive sampling Face-to-face and virtual semi-structured interviews *N* = 11 ICU nurses	Content analysis Constant comparative analysis Member checking	80%	Sample from single healthcare centre Qualitative research cannot be generalized to other settings No documented timeframe for data collection period	Emotions: anxiety, stress, fear, helplessness, worry, empathy Physical symptoms: sleep disturbance, headaches, discomfort, exhaustion, breathlessness Environmental challenges: inability to provide human connection, changing guidelines, isolation, death Social effects: stigma, heroes, strained interactions Coping strategies: co-worker support, social support, wellness, faith
LoGiudice and Bartos (2021)	United States	May – June 2020 1,577,565 cases, 64,382 deaths	To understand nurses' lived experiences during the COVID-19 outbreak and to examine their resiliency	Convergent mixed-method design: descriptive phenomenological method and The Brief Resiliency Coping Scale Snowball sampling and word-of-mouth recruitment *N* = 43 nurses (19 ICU) (10 medical–surgical) (14 mixed)	Colaizzi's method Descriptive Statistics Member checking	90%	Small sample size Lack of racial and sexual diversity among study participants	Most nurses in study "medium" resilience copers Family ties broken: how nurses bridge the gap The never-ending "sanitize cycle" Restorative self-care Proud to be a nurse
Robinson and Stinson (2021)	United States	May 2020 723,546 cases, 41,299 deaths	To understand the experiences of Registered Nurses working with hospitalized COVID-19 patients	Qualitative Hermeneutic phenomenological design Snowball sampling Semi-structured phone interviews *N* = 14 nurses (five ED) (four ICU) (five medical-surgical)	Colaizzi's method Member checking	100%	Small number across 6 different states in the USA Data collected over short period	The human connection: dying with strangers, changing relationships, sharing with the public, relationships with employers, my outlook on life The nursing burden: burdens, PPE, the burden of being a hero, comparisons to war, coping

Abbreviations: ED, emergency department; HCW, health care; ICU/CCU, intensive care unit/critical care unit; ID, infectious disease; JBI CA score, Joanna Briggs Institute critical analysis score; PPE, Personal protective equipment; PTSD, post-traumatic stress disorder; RN, registered nurse.

[a]COVID-19 cases for data collection period calculated by sum of daily cases and deaths between first and the final date of data collection period for the papers country of origin.

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4.2 | Findings

A total of 233 study findings were identified in this review following synthesis, which included the quantitative results being "qualitized", resulting in 227 unequivocal and six credible findings. From the analysis of these study findings, six main themes were identified: emotional experiences of frontline nurses, physical symptoms of a pandemic environment, ethical and moral challenges of COVID-19, professional impact, risk factors to negative emotional experiences, and protective factors and coping strategies for future pandemic events.

4.2.1 | Emotional experiences of frontline nurses

Emotional responses to the COVID-19 pandemic were the most prevalent topic identified by frontline nurses. In one study by Labrague and de Los Santos (2021), the mean score for fear in nurses during the COVID-19 pandemic was above midline. Fear of being infected or infecting family and others was a great source of fear for nurses (Ali et al., 2020; Deliktas Demirci et al., 2021; Galehdar et al., 2020; García-Martín et al., 2021; Liu et al., 2020; Monjazebi et al., 2021). Nurses expressed terror when seeing their patients gasp for air, and in seeing people covered up in personal protective equipment (PPE) (Gordon et al., 2021; Liu et al., 2020). Initially, some nurses were afraid to directly care for patients and were worried they may not survive their work (Franco Coffré & Leví Aguirre, 2020; Zhang et al., 2020).

Stress was another prevalent emotional response experienced by frontline nurses, with 11 studies stating stress as a key element to the nurses' experience (Ali et al., 2020; Franco Coffré & Leví Aguirre, 2020; Galehdar et al., 2020; García-Martín et al., 2021; González-Gil et al., 2021; Gordon et al., 2021; Liu et al., 2020; Mohammadi et al., 2021; Robinson & Stinson, 2021; Sadang, 2021; Tan et al., 2020). Great sources of stress for nurses were the steep increase in hospitalizations and the rapid deterioration of patients (Ali et al., 2020; Liu et al., 2020). Deployment to pandemic units, the high transmissibility of the virus and the possibility of not being able to work whether infected by COVID-19 also increased nurse stress (Deliktas Demirci et al., 2021; Franco Coffré & Leví Aguirre, 2020; Monjazebi et al., 2021). Frontline nurses expressed anxieties around death, burial, the severity of the disease and the inability to save their patients. Nurses were acutely aware that greater patient numbers admitted ultimately meant more impending deaths, and many nurses worried about the conditions in which patients were being buried (Galehdar et al., 2020). Nurses were found to be at high risk of burnout, with 68% at risk during the first wave of the virus, and 38% at risk of emotional exhaustion (Bruyneel et al., 2021). Almost 45% of nurses felt emotionally exhausted at the end of the working day during the COVID-19 pandemic (González-Gil et al., 2021).

On arrival to the front line in Wuhan China, nurses said that they felt powerless to the new disease (Tan et al., 2020). Nurses stated that the images of what they had seen lingered, increasing feelings of depression (Tan et al., 2020). Similarly, nurses in the United States and Turkey expressed feelings of desperation as there was no foreseeable end to the pandemic (Ali et al., 2020; Deliktas Demirci et al., 2021).

4.2.2 | Physical symptoms from a pandemic environment

Frontline nurses were exposed to physical effects of the COVID-19 pandemic. Nurses stated wearing PPE for many hours led to physical discomfort (García-Martín et al., 2021; Gordon et al., 2021; LoGiudice & Bartos, 2021), and many were denied water and toilet breaks in order to avoid doffing PPE (Liu et al., 2020). Nurses noted the heaviness of the PPE (Zhang et al., 2020) and stated an increased tension, describing being soaked with sweat with pressure points on nose and ears (Galehdar et al., 2020; Monjazebi et al., 2021). Nurses described that they could no longer sleep without medical assistance (Monjazebi et al., 2021), and due to increased anxiety and hours of work, sleep was not possible (Gordon et al., 2021; Sadang, 2021). Frontline workers reported a lack of appetite and weight loss (Monjazebi et al., 2021), headaches (Gordon et al., 2021) and physical exhaustion from long PPE use and lack of basic necessities such as food, fluid and toilet breaks (González-Gil et al., 2021; Liu et al., 2020).

4.2.3 | Ethical and moral challenges of COVID-19

Nurses ethics and moral obligations to their career were threatened during the pandemic, stating it was agonizing to see patients suffering, and knowing they could not help (Galehdar et al., 2020; Gordon et al., 2021). Nurses expressed fears and stressors around lack of available treatments and vaccines (Ali et al., 2020; Franco Coffré & Leví Aguirre, 2020; LoGiudice & Bartos, 2021; Monjazebi et al., 2021; Tan et al., 2020). Frontline staff would fight against one effect COVID-19 had on the body just for the patient to die from other complications (Gordon et al., 2021). Nurses conveyed the struggles in delivering bad news to families, informing them that their loved one may die, or had already died (Galehdar et al., 2020; LoGiudice & Bartos, 2021).

Nurses stated acutely unwell patients were unable to communicate care needs or preferences, increasing feelings of neglected patient rights (Jia et al., 2021). Being able to meet the psycho-emotional needs of patients was not possible for some nurses (González-Gil et al., 2021). Seeing fear in patients eyes when having to keep a distance, being gowned and not providing comfort and touch also interrupted care (Gordon et al., 2021; Jia et al., 2021; Robinson & Stinson, 2021). Nurses witnessed other colleagues lessen the frequency of performing nursing tasks due to fear of being infected (Franco Coffré & Leví Aguirre, 2020; Jia et al., 2021).

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4.2.4 | Professional impact

Nurses expressed feelings of courage and devotion to working on the COVID-19 front line, stating that feelings of fear decreased over time (Liu et al., 2020; Zhang et al., 2020). Nurses who were military personnel or members of the Chinese Communist Party experienced what Liu et al. (2020) describe as "patriotic enthusiasm", an inevitable responsibility to protect and serve their country. Other nurses, however, stated that feelings of fear during the pandemic increased employment turnover intentions (Ali et al., 2020; Franco Coffré & Leví Aguirre, 2020; Labrague & de Los Santos, 2021). Frontline nurses voiced that the pandemic gave them a greater sense of professional identity, that their profession was sacred, knowing they entered the profession to alleviate the pain and suffering of their patients (Deliktas Demirci et al., 2021; Sadang, 2021; Tan et al., 2020).

Nurses believed their education had prepared them sufficiently to uphold their responsibility and professional duty to treat patients (Franco Coffré & Leví Aguirre, 2020; Zhang et al., 2020). Renewed energy came from patient appreciation (Zhang et al., 2020), giving nurses a feeling of hero/heroinism, with a greater sense of professional awareness from the public (Deliktas Demirci et al., 2021; Monjazebi et al., 2021). Nurses felt grateful for the opportunity to work and serve in a crisis, regardless of the challenges (Deliktas Demirci et al., 2021; Sadang, 2021); however, some rejected the hero status, stating this was their job and heroes are meant to save lives without exception (Gordon et al., 2021; Robinson & Stinson, 2021).

Nurses in China were re-deployed from original hospitals to the virus epicentre in Wuhan at the beginning of the pandemic, with several stating they lacked experience working in frontline roles (Jia et al., 2021; Tan et al., 2020). Adapting to hospital environments and physical climates of a new region was an increased source of anxiety in some nurses in China and Turkey (Deliktas Demirci et al., 2021; Zhang et al., 2020). Nurses however stated as time went on, they adapted to their new environments and the role became easier (Deliktas Demirci et al., 2021; Monjazebi et al., 2021; Zhang et al., 2020). Graduate nurses had an additional layer of stress, feeling lost and inexperienced on entering the emergency department environment during a pandemic (García-Martín et al., 2021).

4.2.5 | Risk factors for negative emotional experiences

Nurses expressed increased negative emotional experiences with a lack of prior education and preparation to work on the frontline (Galehdar et al., 2020; Jia et al., 2021). Feelings of working in a pressure cooker arose with the lack of specialized training in equipment such as ventilators (Tan et al., 2020). Nurses stated they were terrified, and in danger, they were ill-equipped to protect themselves as they received no specialized virus management training (Tan et al., 2020).

Receiving more patients than approved ratios and the rapid increase in workload increased feelings of burnout and concern in frontline nurses (Ali et al., 2020; Bruyneel et al., 2021). Nurses voiced that the increased workload resulted in both a mental and physical stress increase (Galehdar et al., 2020; Gordon et al., 2021; Sadang, 2021; Tan et al., 2020), stating the work was too intense and a reduction in shift hours was required (Tan et al., 2020). Insufficient staffing levels increased stress levels among nurses (Galehdar et al., 2020; González-Gil et al., 2021; Tan et al., 2020), with many believing they were not valued as doctors were (Deliktas Demirci et al., 2021). Nurses said they had not been given complete information or support from their organizations (Ali et al., 2020; Deliktas Demirci et al., 2021; Galehdar et al., 2020; García-Martín et al., 2021; González-Gil et al., 2021), with some stating that senior managers never enquired about the needs of the nursing staff (González-Gil et al., 2021).

The lack of PPE was a great stress to nurses (Franco Coffré & Leví Aguirre, 2020; Galehdar et al., 2020). Feelings of doubt were identified in the level of protective equipment cover being provided (Sadang, 2021), with staff made to re-use PPE in order to conserve supplies, causing anger among the nursing staff (Gordon et al., 2021; LoGiudice & Bartos, 2021).Nurses expressed anger towards patients who would not cooperate, feeling as though they were risking their own lives to save their patients (Zhang et al., 2020). Nurses were exposed to patients with no regard for public safety measures, coughing and sneezing on them (Galehdar et al., 2020), with some patients behaving more knowledgeable and superior than the treating nurse (Sadang, 2021). Iranian nurses stated that the general public would disobey hygiene behaviours, continuing cultural practices of shaking hands and kissing (Mohammadi et al., 2021). Nurses also stated people were opportunistic, making money by hoarding PPE supplies then selling to make for profit (Mohammadi et al., 2021).

Several frontline nurses felt as though their family, friends and the public distanced themselves or avoided contact altogether (Ali et al., 2020; Franco Coffré & Leví Aguirre, 2020; Gordon et al., 2021). In the Philippines, community quarantine nurses stated their communities would refer to them as a virus, knowing they were frontline workers (Sadang, 2021). For some nurses, working in clinical isolation environments only exacerbated those feelings (Gordon et al., 2021). Nurses detailed that it was social media and television that educated the public and the workforce on the pandemic (Mohammadi et al., 2021). Graduate nurses indicated that they reviewed old study notes and looked to the internet to gain more information (García-Martín et al., 2021). In America, constant changes to regulations and no clear guidelines to management of the virus caused concern (Ali et al., 2020; Gordon et al., 2021; LoGiudice & Bartos, 2021; Robinson & Stinson, 2021), with nurses stating that without guidance and procedures, they had no choice but to turn a grocery store refrigerator truck into temporary morgues to deal with the numbers of casualties in the hospital (LoGiudice & Bartos, 2021).

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4.2.6 | Protective factors and coping strategies for future pandemic events

Conversely to risks identified, there were several stated protective and coping strategies employed by nurses to help them survive the ongoing pandemic. The implementation of group nursing and teamwork in some facilities gave nurses a sense of comradery (Deliktas Demirci et al., 2021; Gordon et al., 2021; Jia et al., 2021; LoGiudice & Bartos, 2021; Robinson & Stinson, 2021). Nurses believed that as this was a global pandemic, they were in this together (LoGiudice & Bartos, 2021; Monjazebi et al., 2021). Frontline nurses benefitted greatly when a positive attitude was shared among colleagues (Franco Coffré & Leví Aguirre, 2020). Stress relief came from decreased work schedules (Ali et al., 2020; Franco Coffré & Leví Aguirre, 2020) and no additional overtime (LoGiudice & Bartos, 2021).

Avoidance of media benefitted nurses as this was a statistically significant stressor for some (Ali et al., 2020; Franco Coffré & Leví Aguirre, 2020; Robinson & Stinson, 2021). Strict adherence to safety measures at home reduced stress (Franco Coffré & Leví Aguirre, 2020). Engaging in hobbies, healthy eating and exercise was important for many (Ali et al., 2020; Deliktas Demirci et al., 2021; Franco Coffré & Leví Aguirre, 2020; Gordon et al., 2021; LoGiudice & Bartos, 2021) as well as meditation and prayer (Ali et al., 2020; Franco Coffré & Leví Aguirre, 2020; Gordon et al., 2021). Nurses found comfort in the support provided by their family and friends (Ali et al., 2020; Franco Coffré & Leví Aguirre, 2020; Gordon et al., 2021; LoGiudice & Bartos, 2021). Some nurses experienced a positive shift in their perspective on life (Deliktas Demirci et al., 2021; Robinson & Stinson, 2021), with nurses in Wuhan said that they had experienced great adversity, giving them hope in their ability to beat the virus (Liu et al., 2020).

It was identified that seniority and experience in the field was a protective factor for nurses (Ali et al., 2020; Bruyneel et al., 2021). Frontline nurses felt empowered with their increased educational outcomes and were able to apply this learning on return to their originally designated wards (Jia et al., 2021). It was identified that nurses originating from frontline and high-risk wards when deployed to COVID-19 centres coped better and had lower stress levels (Leng et al., 2021). Nurses who engaged in learning opportunities throughout the COVID-19 pandemic found this to be a beneficial element to their well-being (González-Gil et al., 2021; Labrague & de Los Santos, 2021).

5 | DISCUSSION

This review of the literature synthesized the known findings of the effects of COVID-19 on frontline nurses during the first 6 months of the pandemic. A total of six major themes were identified from the published literature: emotional experiences of frontline nurses, physical symptoms of a pandemic environment, ethical and moral challenges of COVID-19, professional impact, risk factors to negative emotional experiences and protective factors and coping strategies for future pandemic events. By exploring these key themes, a renewed focus on policy development to protect the well-being of frontline nurses can be developed, assisting nurses in the current pandemic environment and potentially in future pandemic events.

Heightened emotional experiences of frontline nurses during virus outbreak environments was found in this review, which was supported by Chan et al. (2005) and Khalid et al. (2016) during the SARS and MERS-CoV outbreaks. Nurses working during the SARS outbreak in China experienced mental and physical effects of the pandemic such as increased anxiety and fear due to rapid spread of infection, increased workloads and lack of guidance and protocol (Chan et al., 2005). The experiences in previous virus outbreaks mirror the frontline nurses experience in the current COVID-19 pandemic. This evidence suggests that although these pandemic environments were different in their severity, a focus on psychological interventions and improved resource distribution is crucial for frontline nurses.

This review found several organizational factors that influenced frontline nurses experience during the COVID-19 pandemic. A study conducted by Whetzel et al. (2013) highlighted nurses inability to see their role in disaster planning, with a lack of education in this field. Frontline nurses in this review voiced similar experiences, with education evidently lacking, entering the pandemic environment without the essential knowledge of how to protect themselves and their patients. A reoccurring theme across current pandemic events was healthcare worker's obligatory feelings towards their profession, stating that it was their professional duty to serve in times of crisis (Franco Coffré & Leví Aguirre, 2020; Zhang et al., 2020).

Cultural differences in coping strategies, understanding of treatments and protocols and adherence to hygiene guidelines were identified in this review, with nurses reporting these differences as potential barriers to care and health outcomes for both nurses and the public. Studies originating from China highlighted Communist Party members and their desire to protect and serve their country (Liu et al., 2020). Nurses voiced they had an obligation and responsibility to serve their country (Zhang et al., 2020). Similarly, nurses in the Philippines felt grateful regardless of the challenges, grateful for the opportunity to work and serve in a crisis (Sadang, 2021). Iranian nurses identified the importance of herbal medicines in their culture and the practice of personal touch in social settings with the lack of adherence to social distancing requirements. Nurses identified these practices were putting their communities at greater risk of spreading COVID-19 (Mohammadi et al., 2021). Interestingly, one study in the United States outlined the nurses' lack of adherence to public health measures and social distancing rules, outlining potential causative factors being the nurses' perception of risk and severity of COVID-19 with the limited information made available to them (Ali et al., 2020). Case numbers and deaths from COVID-19 during each data collection period were greatest in the United States and, therefore, may be explained by the lack of adherence to public health measures and social distancing rules.

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There was a clear gap in the literature at the time of the review of the experience of nurses in the United Kingdom, Europe and Australia in the first 6 months of the pandemic. The experiences of these frontline nurse populations would allow for a more diverse and complete picture of the experience of frontline nurses during the COVID-19 pandemic. Current published literature frequently incorporates all number of healthcare workers including doctors and allied health workers. By combining the experiences of these differing healthcare professionals, experiences may not be comparable, reducing the likelihood of comprehensive and focused results.

Psychosocial impacts of the COVID-19 pandemic on frontline nurses explored by Xu et al. (2021) were supported in this review, with clear emotional, social and psychological impacts of the pandemic on the frontline nurse population evident in the global literature. This review, however, further elucidated the organizational factors impacting frontline nurses' perceptions, understanding and reasoning behind personal and professional decision-making during the first 6 months of the COVID-19 pandemic. These findings may assist in the development of more robust pandemic and epidemic disaster planning protocols, allowing nurses to contribute to this planning and see their professional responsibility in the planning process.

Identified strengths of this review include the use of the Joanna Briggs Institute (JBI) manual for evidence synthesis to ensure a systematic approach was followed to retrieve all relevant and appropriate studies in this field during the data collection period outlined. There were however limitations identified in this review. Due to the infancy of the COVID-19 pandemic, there was limited comparative literature on the effects experienced by frontline nurses available at the time of publishing. The lack of data about the COVID-19 cases and deaths for some studies in the review meant that context was missing for the extent to which nurses experienced effects of the pandemic in their country. Some studies did not include a period for data collection, making it difficult to provide a context of the current COVID-19 situation. Not all studies provided a definition of what a "frontline" nurse was, with some studies not including current ward and exposure information. It was determined that if the nurse participants had been in contact with COVID-19 patients for some or most part of the data collection period, they were to be included in the review.

6 | CONCLUSION

Frontline nurses have faced numerous challenges following the announcement of the COVID-19 global pandemic. The array of emotional experiences such as fear, anxiety and emotional exhaustion compounded by the lack of research and clear guidelines and procedures. A lack of support and resources from organizations, and the intense ethical and moral turmoil faced when treating patients have left these nurses burnout, isolated and considering whether a future in their chosen profession is detrimental for their emotional and physical well-being. It is essential for organizations, policy makers and global leaders to recognize the trauma the pandemic has caused to frontline nurses, ensuring that adequate support can be implemented on a personal and organizational level. Additionally, disaster preparation and education in the workplace and tertiary education setting are essential in ensuring frontline nurses feel prepared and can identify their professional role and responsibility in education and disaster planning. A strengthened focus on the physical and mental well-being for frontline nurses is crucial in reducing the risk of posttraumatic stress disorders and burnout in the workforce, ensuring that they are provided adequate support and opportunities for flexible working arrangements. By providing nurses with the required resources to perform their roles in a multitude of healthcare crisis leads to an empowered workforce, one that can withstand local and global crisis ensuring that nurses remain in the health profession.

AUTHOR CONTRIBUTIONS

MJ; was responsible for the conception of the study with expert guidance for the design of the study by (JP and CM) and made the final revisions to the paper and submitted it. MJ was responsible for the collection and interpretation of data and drafting of the manuscript. JP; assisted with the independent review of individual papers and was the primary supervisor of (MJ). CM; was a co-supervisor to (MJ) and provided expert guidance throughout the project. MJ, JP and CM; revised the manuscript.

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The authors declare that they have no conflict of interest.

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