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REVIEW ARTICLE

An exploration of the psychological impact and support needs of nurses during a pandemic: A qualitative systematic review

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Abstract

Aim: When a public health emergency occurs, nurses play an important role on the front lines and experience tremendous physical and mental stress. This review aims to synthesize existing qualitative studies exploring the psychological impact and support needs of nurses.

Design: Qualitative systematic reviews. Registered in PROSPERO (CRD42021288509).

Methods: This review uses the PEOD framework to explicitly identify qualitative questions and systematically searches four electronic databases (CINAHL, MEDLINE, PubMed, PsychINFO) for articles published between 25 March 2000 and 27 December 2020.

Results: A total of 10 studies published in English from 2005 to 2020 were included in the review. Following the quality critical appraisal, 26 concepts were extracted and six descriptive themes were synthesized into three analytical themes: (1) positive psychological drive, (2) need more formal supports and (3) need to be treated fairly. During sudden public health incidents, it is crucial to provide support to family members, offer psychological counselling and isolation training to nurses, while considering cultural factors and appropriate methods. Organizations and governments should prioritize establishing a robust and effective psychological support system.

KEYWORDS
coronavirus disease 2019 (COVID-19), nurses, pandemic, psychological, qualitative study, support needs

1 | INTRODUCTION

A pandemic is an epidemic disease outbreak that occurs over a wide geographic area and affects an exceptionally high proportion of the population, causing tremendous suffering, disruption of normal life and even death (Madhav et al., 2017). Since December 2019, the world has experienced the rapid spread of novel pandemic disease, coronavirus disease 2019 (COVID-19) (World Health Organization 2020a, 2020b, 2020c, 2020d). The familiar rhythms of daily life have been completely disrupted owing to the threat of infection and death, with case numbers increasing worldwide. However, humanity has faced more than one pandemic in this era. Since 2003, outbreaks of infectious diseases have become increasingly serious, for example, the pandemics of severe acute respiratory syndrome (2003), H1N1pdm influenza (2009), Middle East respiratory syndrome (2012), chikungunya (2014) and Zika virus (2015). The rapid spread of a pandemic, as in the case of COVID-19, and the potential for relatively high mortality rates associated with the pandemic have contributed to the current crisis, which has a tremendous effect on the well-being of individuals, societies and economic and public activities worldwide

(Fernandes, 2020). Before COVID-19, burnout, poor work conditions and Job dissatisfaction remain a persistent issues affecting nurses across the health system (Clark & Lake, 2020; Schlak et al., 2021). In addition, during the COVID-19 pandemic nurses are the main personnel involved in screening and treatment at the front line (Spoorthy et al., 2020). Therefore, nurses are placed in unpredictable and high-risk situations that increase the probabilities of physical, mental and emotional distress (Lai et al., 2020).

2 | BACKGROUND

Nurses represent the largest group of health care providers globally. There are nearly 28 million nurses around the world, accounting for approximately 60% of medical and health workers and providing approximately 90% of basic medical services worldwide (World Health Organization, 2020c). Medical treatment, surgery, prescriptions and vaccinations are necessary and life-saving methods, but they are also interim and time-limited measures. On the contrary, the ongoing important care required for recovery and rehabilitation requires a large amount of labour and time. The provision of nursing services can effectively improve the patient survival rate when effective medical resources are scarce. A nurse administers fluids lost by the patient, nutrition needed by the body and provides an environment conducive to recovery. Nurses also apply skilled measures, such as enabling patients with uncontrolled vomiting and diarrhoea to retain fluids and nutrients and to have sufficient warmth and good ventilation without exacerbating fever. During an epidemic or pandemic, these forms of care make individuals and families aware of their medical needs; thus, it can be said that medical care is important, but nursing care is essential.

As the largest group of health professionals, nurses have been providing patients with care on the front line and are directly exposed to hazards like infectious agents, including the virus that causes COVID-19, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This makes nurses very susceptible to illness because respiratory pathogens are spread via droplets and close contact with infected individuals (Koh et al., 2012). The data show that 4 of the 70 deaths in Taiwan caused by the SARS outbreak were among nurses (Chiang et al., 2007); the infection rate for COVID-19 among medical staff may be higher. Although most medical workers are willing to take occupational risks in a pandemic environment, some believe that the risks are too great (Koh et al., 2012), which is partly responsible for some nurses resigning (Martin et al., 2013). This increases pressure on health service systems that urgently need labour during a pandemic. Therefore, it is necessary to investigate the psychological impact and support needs of nurses.

2.1 | Research question

2.1.1 | What is already known about

- Nurses have a fear of unknown diseases.

2.1.2 | In this systematic review

- Explore the life and work experiences and psychological impacts on nurses caring for patients during a pandemic to provide recommendations for practice and research.
- What are the psychological impacts and support needs of nurses caring for patients during a pandemic?

3 | METHODS

The review protocol is registered in PROSPERO (CRD42021288509).

3.1 | Inclusion and exclusion criteria

Articles were included if they (1) included qualified nurses; (2) reported data regarding a pandemic; (3) reported nurses' views on psychological effects; (4) were primary studies; (5) comprised qualitative research; (6) were published in English. The detailed inclusion and exclusion criteria are presented in Table 1.

3.2 | Search strategy

We used the PEOD framework (population, exposures or interventions and design) to explicitly identify qualitative questions (Khan et al., 2011). Therefore, this review can be divided into four components (population, exposure, outcome and study design) according to PEOD (Table 2). Using these four components of the research question, we performed a preliminary search in MEDLINE (Appendix 1) and CINAHL to determine relevant keywords for all components. We then systematically searched four electronic databases (CINAHL, MEDLINE, PubMed, PsychINFO) between 18 December 2019 and 30 December 2020, Searches were conducted by a research team member with expertise in conducting systematic reviews. Infectious diseases resulting in epidemics and pandemics have moulded human history and lasted until today (Khan et al., 2020). Therefore, we searched for articles published between 25 March 2000 and 27 December 2020. To identify additional relevant articles, researchers conducted a manual search of reference lists using Google Scholar (Boland et al., 2017). On 31 December 2020, we searched Open Grey (www.opengrey.eu) to identify any relevant new research. We used Boolean operators and free text words for the four components of PEOD.

3.3 | Study selection

According to the search strategy, a total of 740 articles were identified in the four electronic databases searched. The screening process is presented using a PRISMA flowchart (Figure 1). Using EndNote20, we deleted 160 duplicate studies; the remaining 580 studies were

TABLE 1 Inclusion and exclusion criteria.

Subject	Inclusion	Exclusion
Participants	Qualified nurses (nurses who have passed a specific national nurse practitioner exam and obtained a licence)	Educational nurses; student nurses; assistant nurses
Exposure	Pandemics such as SARS, MERS, H1N1 and COVID-19; front-line workplace, such as a hospital or community	Ebola (Ebola virus is spread through bodily fluids in the final stages of the disease); school settings
Outcome	Nurses' views or psychological effects	Nursing skills; technique and support interventions
Design	Primary studies and qualitative research; English language research	Non-English studies; quantitative studies, mixed studies and reviews

Abbreviations: COVID-19, coronavirus disease 2019; MERS, Middle East respiratory syndrome; SARS, severe acute respiratory syndrome.

TABLE 2 Research question and PEOD template.

Population (P)		Nurses					
Exposure (E)		Caring patients during pandemics or epidemics					
Outcome (O)		Psychological impacts and support needs					
Design of study (D)		Qualitative studies					
	Participants	AND	Exposure	AND	Outcomes	AND	Design
OR	Nurses		Pandemic*		emotional support		Qualitative research
OR	Nursing		Pandemic outbreak		Support for nurses		
OR	Nursing staff		Disease outbreaks		Lack of support		
OR	Practical nurses		Epidemic*		Psychological support		
OR	Registered nurses		H1N1		mental health support		
OR	Nurs*		Coronavirus infections		Support needs		
OR	Head nurse		Pandemic response		supports		
OR	Nurse leader		COVID-19		demands		
OR	Nurse manager		Coronavirus		Attitude*		
OR			MERS		Experience*		
OR			Middle East Respiratory Syndrome		Feeling*		
OR			novel influenza A		View*		
OR			swine flu		Life experience		
OR			Pandemic influenza		Job experience		
OR			SARS		Work experience*		
OR			SARS virus				
OR			Severe Acute Respiratory Syndrome				
OR			severe acute respiratory syndrome coronavirus 2				
OR			Infectious diseases				
OR			public health emergencies				

Abbreviations: COVID-19, coronavirus disease 2019; MERS, Middle East respiratory syndrome; PEOD, population, exposures and design; SARS, severe acute respiratory syndrome.

included. After scanning the article titles, abstracts and comments, 13 articles were retained. Of these 13 studies, a total of 10 articles were included in the final review. In addition, five researchers performed the screening process, four independent reviewers reviewed abstracts and titles against the eligibility criteria. The full text of relevant studies was then assessed and eligible studies were

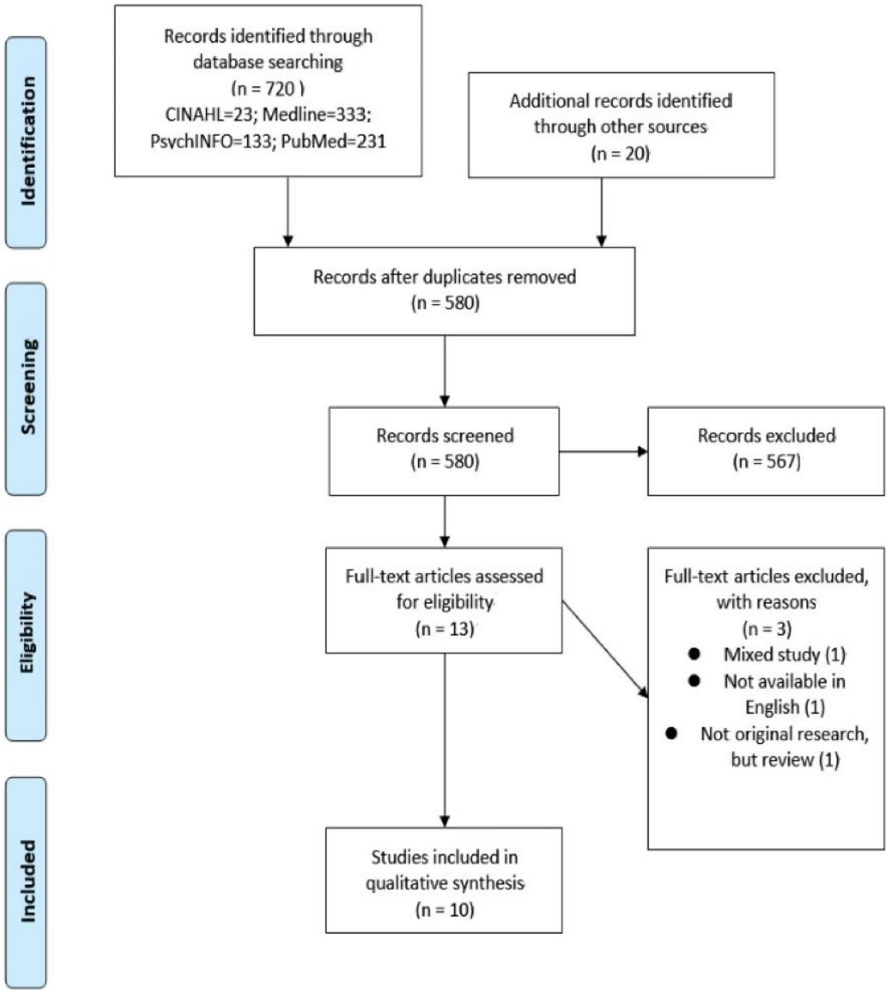

FIGURE 1 PRISMA flow diagram.

finally included. Any disagreements were recorded and resolved in consultation with a fifth reviewer.

3.4 | Quality assessment

Table 3 enumerates 10 studies incorporated in the analysis and appraised utilizing the Critical Appraisal Skills Programme (CASP) qualitative checklist (Appendix 2). Recruitment strategies for most studies were appropriate, except for Bergeron et al. (2006), which used a big data questionnaire survey and did not discuss data saturation. Furthermore, six studies did not clearly state the relationship between researchers and participants (Bergeron et al., 2006; Lee & Lee, 2020; Liu et al., 2020; O'Boyle et al., 2006; Shih et al., 2009; Zhang et al., 2020). Two studies simply mentioned that they had been approved by an ethics committee without providing more detailed information (Bergeron et al., 2006; Sun et al., 2020). Overall, the 10 included studies clearly stated the purpose and results of the study and made contributions to clinical practice, policy-making, future research and existing knowledge, all factors that are considered the main criteria for high-quality published research (Gregor & Hevner, 2013).

3.5 | Data extraction

Data extraction and data synthesis were conducted in steps. First, in order to identify and extract the fundamental characteristics of each included study, the Characteristics of the included studies form (Appendix 3) was employed, and the resulting information is presented in Table 4. Second, the findings with excerpts illustrating the main findings were also extracted. To ensure the accuracy of interpretation, each article was read independently by two reviewers.

3.6 | Data analysis

Following the guidelines of Thomas and Harden (2008), we integrated the included studies in the following three stages to achieve a high-level analysis. In the first stage, the text was coded line by line. For each included study, the review author wrote the text code line by line to capture the meaning and content of each sentence in an inductive way. This helped us to connect concepts from one study to another (Britten et al., 2002). In the second stage, namely, the development of descriptive themes, the original themes were

TABLE 3 Summarized results of quality assessment (CASP 2018).

	Liu et al. (2020)	Shih et al. (2009)	Chung et al. (2005)	O'Boyle et al. (2006)	Kim (2018)	Bergeron et al. (2006)	Lee et al. (2020)	Sun et al. (2020)	Zhang et al. (2020)	Lee & Lee (2020)
Clear statement of the aims of research	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Appropriateness of qualitative methodology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Research design consistent with the aims of research	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Appropriateness of sampling strategies	✓	✓	✓	✓	✓	−−	✓	✓	✓	✓
Data collection strategy appropriate	✓	✓	✓	✓	✓	−−	✓	✓	✓	✓
Relationship considered between research and participants	−−	−−	X	−−	✓	−−	✓	✓	X	X
Ethical issues considered	✓	✓	✓	✓	✓	−−	✓	−−	✓	✓
Data analysis rigorous	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Clear statement of the results	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Value of the research	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: Description: ✓, yes; −−, cannot tell; X, no.

grouped according to their similarities and differences and relationships between codes were identified to classify them using a hierarchical structure; a new code was then developed for each group. To capture the meaning of the group from the original code by sharing findings regarding the research topic, these findings were combined using a list of themes. The third stage involved generation of analysis topics beyond basic research to generate new conceptual understanding (Humble & Radina, 2018). Nvivo (12 Pro) was used to organize the extracted data and to improve time efficiency.

Table 4 lists the characteristics of the 10 included studies. Because pandemics occur so infrequently, these 10 studies were conducted between 2005 and 2020 in the following countries/regions: China ($n = 3$), Taiwan ($n = 1$), Hong Kong ($n = 1$), the United States ($n = 1$), South Korea ($n = 3$) and Canada ($n = 1$). All studies used qualitative methods and were written in English. Of the 10 studies included in this review, nine were aimed at understanding nurses' life and work experiences or feelings during a pandemic or public health emergency. One study was from the perspective of the head nurse as manager and explored the kinds of support that should be provided to nurses during this type of event (Shih et al., 2009). Except for one study that used questionnaires, all studies used interviews to collect the data. A range of 8–70 nurses was recruited in these nine studies, with a total of 0.5–22 years of nursing experience and most were women ($n = 150$). Another study collected survey responses from 898 nurses using a questionnaire.

3.7 | Ethics

This is a systematic review of the literature, so no research ethics committee approval is needed.

4 | RESULTS

After multiple coding processes and identifying comprehensive themes, three core themes emerged: (1) positive psychological drive (inner positive support, external positive support), (2) need for more formal support (factors affecting nurses' psychological well-being, nurse working with anxiety) and (3) need to be treated fairly (hospital factors, social factors). The themes identified in each study are detailed in Table 5 and the synthesis results are listed in Table 6.

4.1 | Positive psychological drive

The theme 'positive psychological drive' refers to the psychological support nurses receive to be able to take care of patients during a public health crisis such as a pandemic, including external support and internal support. These provide effective psychological support for nurses and help them to survive this type of difficult event, to a certain extent.

TABLE 4 Characteristics of the included studies.

References	Country; language	Aim	Design	Sample participants characteristics	Data collection and analysis	Outcomes
Liu et al. (2020)	Wuhan, China; English	To describe the experiences of health care providers who had no infectious disease expertise in the early stages of the outbreak	An empirical phenomenological approach	Purposive sampling (Nurses, *n* = 9; 7 female; two male) The nurses' average age was 29, and the average time working at the COVID-19 ward before interview was 14 days. They original department was Stomatology (1), Oncology (3), Neurosurgery (5). The average work experience year was 7 years.	Semi-structured, in-depth interviews by telephone Haase's adaptation of Colaizzi's phenomenological	• Health care providers were constantly in fear of becoming infected, also afraid transmitting the virus to their colleagues and family members • The patient's condition deteriorated or died, which made the medical staff feel frustrated • Support from patients, family members, friends and society can effectively support the psychology of health care provider • Health care provider used self-management strategies to maintain a good mood • Hospitals and the government provided a series of measures to maintain the psychological wellbeing of health care provider
Shih et al. (2009)	Taiwan; English	To explored Taiwan's nurse leaders' reflections and experiences of the difficulties they encountered and survival strategies they employed fighting the severe acute respiratory syndrome epidemic	A two-step within-method qualitative triangulation research design	Purposive sample (nurse leader, *n* = 70; 65 female; five male) The participants' age from 22 to 56 years (mean = 27.61 SD 4.5). Educational level (college *n* = 22; university *n* = 30; graduate *n* = 18). Professional nursing experience ranged from 2 to 24 years (mean = 13.52 SD 3.4). Religious affiliation (Confucianism *n* = 40; E-Quan Taoism *n* = 48; Buddhism *n* = 12; Protestantism *n* = 8; Catholic *n* = 2)	Focus group in-depth interviews then completed an open-ended questionnaire Hobfall's concepts of conservation of resources	• At the beginning of the epidemic, rumours, one-sided media reports and concealment by the hospital leadership caused the nursing staff to fear, anger and pain • Nursing managers updated the nursing process, hold seminars and share experiences to reduce the psychological burden on nurses and allow them to rebuild their confidence • Provide psychological support, among which effective psychological support strategies: taking initiatives to provide hospitality to others; encouraging oneself and health team members to practice daily positive thinking; sharing complaints with good friends or reliable nurse leaders; encouraging others with empathetic words, a smiling face and therapeutic touch; and daily appreciating others' kind thoughts, good deeds, or special talents • Half of the participants admitted that support from family members and religious beliefs can provide psychological comfort • Confusing diagnosis and lack of effective treatment plans have led to an increasing number of infections and deaths among healthcare workers. The hospital requires some nurses to stay at home without a salary. As a result, nurses are under tremendous psychological pressure

TABLE 4 (Continued)

References	Country; language	Aim	Design	Sample participants characteristics	Data collection and analysis	Outcomes
Chung et al. (2005)	Hong Kong; English	To explore in depth the experiences of nurses' caring for SARS patients in Hong Kong	A phenomenological design	Purposive sample (Nurse $n = 8$; 4 female; 4 male), The participants' age from 21 to 40 years (average age was 25 year), Years of clinical experience ($n = 2 > 10$ years; 0.5 year, $n = 4$; 1.5 year, $n = 1$; 3 years, $n = 1$)	Husserl's philosophy Colaizzi's approach	• The nurses frequently mentioned feelings of powerlessness, stress, unfamiliarity, frustration, vulnerability, threat and empathy when caring patient during pandemics. The sense of powerlessness was described by participants as a core element of feeling • Health care providers are very afraid of contracting this deadly infectious disease and feel that their lives are threatened. When caring for patients who are medical staff, the nurses who take care of them will be very vulnerable • The patient's understanding and gratitude for the nurse's work have a positive effect on the nurse's psychology and emotions
O'Boyle et al. (2006)	US; English	The aim was to identify interventions nurses believe will support their ability to cope during public health emergencies	A qualitative research design was used with a purposive sampling strategy	Purposive sampling (Nurse, $n = 33$) Recruited nurses from critical care, medical–surgical units and emergency departments in three metropolitan hospitals designated as bioterrorism-receiving sites	Focus group sessions Thematic analysis	• Nurses worry about their safety, and second, they worry about spreading infectious diseases to patients and their families • The chaotic environment of the clinic can make nurses feel scared • Lack of opportunities to communicate with family members aggravates nurses' anxiety
Kim (2018)	South Korea; English	To aimed to identify nurses' experiences of care for patients with Middle East respiratory syndrome-coronavirus	Phenomenological approach	Purposive sampling (Nurse, $n = 12$; 8 female; 4 male). The participants' average age was 31.83, and the average clinical career had a duration of 6.88 years. 11 participants had bachelor's degrees, and one had an associate's degree; six participants were married, and two were head nurses. Nine participants worked in wards, and three worked in ICU.	Colaizzi's phenomenological method In-depth individual interviews	• Some nurses are unwilling to go to the infection ward, but they cannot easily refuse. They were afraid of infection and were forced to work in the infection ward, which made them feel uneasy. • Media reports that the death toll is increasing, making nurses frightened and scared • In the early days when nurses worked in the intensive isolation ward , when the patient fell asleep with medication, the quiet environment made the nurse feel uneasy and felt abandoned. • The pressure and dissatisfaction of patients and family members will be projected on the nurses, causing the nurses to bear the great psychological pressure and cause insomnia • Outsiders will avoid contact with participants and discriminate against family members. This makes the participants angry and sad • The nurse's psychology will change with the patient's condition • The support and communication of colleagues, family, friends, society and hospitals play a positive role in nurses' psychology

(Continues)

TABLE 4 (Continued)

References	Country; language	Aim	Design	Sample participants characteristics	Data collection and analysis	Outcomes
Bergeron et al. (2006)	Canada; English	To enhance understanding of the influence of the SARS crisis on the work and personal lives of community nurses	Qualitative research analysis Thematic analysis.	Purposive sampling $n = 898$; settings included public health ($n = 290$), home care ($n = 280$), community care access centres ($n = 197$), nurse practitioner ($n = 15$) and clinics nurse ($n = 116$)	Questionnaires Thematic analysis	• Discrimination and refusal of contact in society made participants feel angry and sad. Participants are afraid and worried that they will be infected and spread to their families.
Lee et al. (2020)	Korean; English	To explore the experiences of Korean nurses who had directly cared for patients with MERS and to derive the structure and meaning of these experiences	Phenomenological qualitative approach	Purposive sample (nurse, $n = 17$; 13 female; four male). The aged 32.06 ± 3.19, working experience was 9 ± 4.26, the education level of participants was associate's degress ($n = 4$); bachelor's degree ($n = 10$); master's degree ($n = 3$), six participants were married, and three of them have a child; eight participants lived with family. The working department of participants was ICU ($n = 13$); ER ($n = 2$); General ward ($n = 2$)	In-depth interviews Semi-structured interviews Open questions Content analysis	• Participants entered the isolation ward at the request of the head of the department to work. They were afraid and worried about unfamiliar infectious diseases and their infectiousness. • When nurses provide care, they hesitate due to the contagious nature of the disease. Nurses will blame themselves, psychologically suffering from moral conflict. • The public regards the participants as pathogens, causing discrimination against the participants and their families, which makes the participants feel sad. • The improvement of the patient's condition and the support of family, friends and colleagues play a positive role in the nurse's psychology. • Some participants experienced depression and helplessness after the epidemic ended.
Sun et al. (2020)	Henan China; English	To explore the psychology of nurses caring for COVID-19 patients	Phenomenological approach	Purposive sampling (nurse, $n = 20$; 17 female; three male). The age between 25 and 49 with an average age of 30.60 ± 6.12. the working experience ranged from 1 to 28 years with an average of 5.85 ± 6.43 all nurses possessed a bachelor's degree. Seven nurses were married with children, five were married without children, and eight were unmarried without children. 17 general nurses and three head nurses.	Face to face or telephone interviews Colaizzi's phenomenological method	• Significant amount of negative emotions in the early stage • Coping and self-care styles with negative emotions • Positive emotions occurred simultaneously or progressively with negative emotions

TABLE 4 (Continued)

References	Country; language	Aim	Design	Sample participants characteristics	Data collection and analysis	Outcomes
Zhang et al. (2020)	China Hospitals; English	To examining the psychological experiences and processes of change among nurses at the epicentre of COVID-19, and offering strategies nurses can use to manage stress	Qualitative descriptive study	Purposive sampling method • Nurses: $n = 23$ • 18 females, five males • Age range: 23–40 • Mean age: 31.5 • Work experience range: 2–20 • Mean work experience: 7.58	Semi-structured interviews	• The psychological change process of frontline nurses had three stages, early, middle and later stages • The psychological characteristics were ambivalence, emotional exhaustion and energy renewal, respectively • Nurse leaders were engaged in facilitating frontline nurses' psychological adaptation
Lee & Lee (2020)	South Korea Hospital; English	To explore the experiences of COVID-19-designated hospital nurses in South Korea who provided care for patients based on their lived experiences	Qualitative study Giorgi's phenomenological method	Purposive and snowball sampling • Nurses: $n = 18$ • 18 females, zero males • Age range: 20–49 • Mean age: NR • Work experience range: 2–22 years • Mean work experience: 7.44	In-depth interviews Giorgi descriptive phenomenology method	• Nurses in COVID-19 hospitals were pushed into the forefront of the pandemic • Lack of preparation • Nurses experienced changes at work and home due to COVID-19 • Nurses' motivation decreased as their efforts were not properly recognized • Exhaustion for the protracted pandemic • Negative emotions • Social support from peers, family, friends, patients and the public • The positive meaning from work and self-growing

Abbreviaitons: COVID-19, coronavirus disease 2019; ER, emergency room; ICU, intensive care unit; MERS, Middle East respiratory syndrome; SARS, severe acute respiratory syndrome; SD, standard deviation.

TABLE 5 Themes identified in each study.

Themes	Liu et al. (2020)	Shih et al. (2009)	Chung et al. (2005)	O'Boyle et al. (2006)	Kim (2018)	Bergeron et al. (2006)	Lee et al. (2020)	Sun et al. (2020)	Zhang et al. (2020)	Lee & Lee (2020)
Positive psychological drive										
Inner positive support	YES	YES	–	–	YES	–	YES	YES	YES	YES
Positive external support	YES	YES	YES	–	YES	YES	YES	YES	YES	YES
Need more formal supports										
Factors affecting nurses' psychological well-being	YES	–	YES	YES	YES	YES	YES	YES	YES	YES
Nurse work with worry	YES	–	YES	YES	YES	YES	YES	YES	YES	YES
Need to be treated fairly										
Hospital elements	–	YES	YES	YES	YES	YES	–	–	–	YES
Social element	–	YES	YES	–	YES	YES	YES	–	–	YES

4.1.1 | Inner positive support

Participants with strong religious beliefs reported that their beliefs served as an effective internal psychological support. Some participants even expressed their willingness to give their lives while performing their nursing duties because they believed that this could be God's plan for them (Shih et al., 2009).

> 'participants with strong religious affiliations relied on the inner strength from the promise and power of their god(s) to carry them through the life crisis that SARS represented. Some Protestant participants reported a willingness to give up their lives during the care delivery process; sacrificing their life as a blessing to others was thought to be God's plan for them' (Shih et al., 2009).

Most participants reported the use of psychological defence mechanisms and self-regulation to give themselves psychological support (Bergeron et al., 2006; Chung et al., 2005; Kim, 2018; Lee et al., 2020; Liu et al., 2020; Shih et al., 2009; Sun et al., 2020). When negative psychological effects appeared, nurses constantly affirmed their achievements and efforts and told themselves that any challenges could be overcome and changed (Kim, 2018; Liu et al., 2020). Participants found that constant self-affirmation not only provided nurses with effective psychological support but also made them stronger (Kim, 2018). However, some participants chose to use work as a way of shutting themselves off from psychological effects; for other nurses, crying was a way to vent emotions and have some psychological relief (Sun et al., 2020). Nurses also actively used certain relief techniques, such as breathing relaxation, mindfulness and music meditation to cope with psychological stress (Bergeron et al., 2006; Chung et al., 2005; Kim, 2018; Shih et al., 2009). Hobbies, such as cooking, reading books, watching movies, sleeping and playing sports also helped nurses to self-regulate (Kim, 2018; Sun et al., 2020). Nurses are professional health workers; therefore, some nurses took the initiative to collect information and analysed medical data to find beneficial information that would encourage themselves and other colleagues (Sun et al., 2020).

> 'My method is not to think about stress, I shield it out of my life'. (Sun et al., 2020)

> 'I can't help crying when I'm under too much pressure and I feel relaxed after crying'. (Sun et al., 2020)

> 'I like reading, watching movies, and writing. After work, many physicians returned to their own room in the hotel, and they were alone. I told them to do something they like after work, rather than keep thinking about the work'. (Liu et al., 2020)

> 'We didn't even say we're scared. I got exhausted and annoyed many times, but I didn't give up. I told myself

TABLE 6 Synthesis results.

Analytical themes	Descriptive themes	Grouped initial codes
Positive psychological drive	Inner positive support	Religious belief
		Self-management strategies
		The mission of the nurse profession
	External positive support	Friends, colleagues and family
		Hospitals and governments
		The patient's understanding and identification
		The social recognition
Need more formal supports	Factors affecting nurses' psychological well-being	Colleague's infection
		Environmental factors
		Ethical conflicts
		Family factors
		Patient's relatives
		PPE elements
		The patient's condition
		The patient's mood
	Nurse work with worry	Being alone
		Fear of being infected
		Fear of infecting family members
		Fear of the unknown
		Fear to infecting patients
		Sequelae of trauma
Need to be treated fairly	Hospital elements	Indemnity insurance
		Hide the truth
		Mandatory recruitment
	Social element	Media rumours
		Social stigma

> all the time, "I have to overcome and I can do it." This made me very zealous. Now, I can work calmly and courageously in emergency situations'. (Kim, 2018)

The professional mission of nurses during a public health emergency is another factor that can support their psychological well-being (Kim, 2018; Lee & Lee, 2020; Lee et al., 2020; Liu et al., 2020; Sun et al., 2020; Zhang et al., 2020). Although, when some nurses were called to the front lines, they displayed a fear of these inevitable duties. (Lee & Lee, 2020). However, professional commitment is the foundation of nurses' drive and enthusiasm, and professional values support their willingness to take risks and work on the front lines of the pandemic without hesitation (Liu et al., 2020; Sun et al., 2020; Zhang et al., 2020). Nurses take pride in their contributions to pandemic control and are satisfied with the opportunity to realize the value of their profession (Lee & Lee, 2020; Sun et al., 2020; Zhang et al., 2020). This sense of mission is crucial to helping them overcome difficulties on the front lines of the fight against the pandemic (Lee & Lee, 2020; Liu et al., 2020; Sun et al., 2020; Zhang et al., 2020).

> 'Although I was scared in the face of the epidemic, I haven't flinched. I don't have grand ideas. I think this is responsibility'. (Sun et al., 2020)

> 'I had never thought about [my] job as a nurse in my seven years of work—it was just a way to make money. But while I took care of patients with MERS, I came to think, 'Even if I get sick or get bad, I'm a nurse, and it is worth it just as it is.' The MERS epidemic was a turning point for me. How do I work and what [kind of] nurse should I be in the future? I think I've become a bit serious about looking at my job. Should I say that my boundaries have expanded? I felt that something went a step further'. (Lee et al., 2020)

> 'I was so worried before I came here. But after I started working, I thought that maybe our ward could be the safest place. It wasn't crazily scary because of

PPE. Of course, it was hard, but I kept thinking that I could handle this situation as a nurse. If the same situation re-occurred, I would volunteer again. Maybe I could do better next time because of my experiences this time'. (Kim, 2018)

'We must try our best to win this battle. As health-care providers, we are at the forefront. I fight for my family, and I fight more for this society. This is my duty because I am a medical worker. No matter what will happen …' (Liu et al., 2020)

4.1.2 | External positive support

The support and understanding of family members were reported to be the most powerful psychological support among nurses. Messages from family such as verbal encouragement were reported as powerful support to lessen nurses' psychological burden (Lee et al., 2020; Liu et al., 2020; Sun et al., 2020). When nurses are working, family members often take over the role of the nurse in the home and care for parents and children (Shih et al., 2009). Furthermore, effective psychological support can also be received from colleagues who are working with them at the front line. Mutual recognition, encouragement, care and help among colleagues enhance collective strength and team cohesion, which allows nurses to deal with fear because they do not feel that they are alone (Kim, 2018; Lee et al., 2020; Sun et al., 2020). Colleagues with previous experience in an epidemic also shared successful experiences to motivate other nurses (Kim, 2018).

'Everyone is very welcoming and friendly. Experienced colleagues will take the initiative to teach me. I also take the initiative to teach new colleagues. We encourage each other. It doesn't feel like I'm fighting alone, I'm not afraid'. (Sun et al., 2020)

'My family calls or sends WeChat greetings every day, and I feel very happy'. (Sun et al., 2020)

'I think we always cared about each other—helping each other so hard. I knew how hard it was; so, I gave a little more. I didn't have to do it; but I tried to do what I could for the others. Nobody instructed me to do it; but I tried to help the others. I think it was a great strength to voluntarily try to help each other'. (Lee et al., 2020)

'My husband was really angry when I said I was going to the isolation ward… 'Should you go there if it's dangerous? Are you the only one there to go?' But later, he told me that he was proud and respectful of me working hard in such a difficult environment. I was really encouraged at that time'. (Lee et al., 2020)

Because we were all trained nurses, we didn't have to care about each other's work. Everybody thought, "We are a team" We helped each other a lot. We would check the electronic medical record at the dormitory in advance so that our colleagues wouldn't reach the dormitory late. We tried to have fun at work. We became good friends and are still in touch with each other. (Kim, 2018)

'family members took over participants' family roles to care for their dependent family members during their absence because of long working hours or their isolation during observational periods in the hospitals'. (Shih et al., 2009)

'When I feel stressful, I complain to my boyfriend. He is also a nurse, and we are in the same department. We communicate with and understand each other'. (Liu et al., 2020)

As the object of nursing care, nurses reported that patients' affirmative understanding of nurses' work has a positive effect on their well-being (Chung et al., 2005; Kim, 2018; Lee et al., 2020; Liu et al., 2020; Sun et al., 2020). During the early part of a pandemic, governments and hospital authorities have provided special psychological support for health care staff, such as online psychological consultation and a series of video support measures to help nurses and other medical staff to deal with negative emotions (Liu et al., 2020; Sun et al., 2020).

'Every time I take care of the patients, they will take the initiative to put on a mask. I feel particularly safe in my heart. After treatment, they will keep saying 'thank you' and it feels good. Patients are very cooperative with our work. Although some patients have emotions due to illness, they show great respect to us'. (Sun et al., 2020)

'I was overwhelmed by a patient saying he/she didn't know that the nurse was so important to the patient. [He said] 'Me, as the only person left in the quarantine, was only visited by nurses. You are the only ones who I could talk to face-to-face—the ones I could count on—were nurses….' I'm sorry I didn't seem to have done much to this patient. Still, I'm a nurse, and I was thrilled to feel like I was helping these people…' (Lee et al., 2020)

'The praise from patients and other department staff became a good reward for their effort'. (Kim, 2018)

'One patient said, 'Thanks for taking care of me…. I know that you all did so much for me. I could

remember your voice even when you had a mask on.' That gave me such a warm feeling because I saw that this patient was improving'. (Chung et al., 2005)

'I needed to establish an intravenous line for a patient with poor perfusion; it was cold that day and wearing the PPE made the work harder. I failed to get a line six times and I apologised to him, but he said, 'I know you did your best'. He was grateful to us for taking great risks to take care of them [patients with COVID-19]. Nurses and patients understand each other, and the relationship is much better than usual'. (Liu et al., 2020)

Praise from the public for nurses and medical workers is an important kind of psychological support (Bergeron et al., 2006; Kim, 2018; Sun et al., 2020), such as treating health care workers like heroes (Sun et al., 2020). In addition, the media has given the front-line medical staff the same role as soldiers, charging the front-line pandemic battlefield, which has made some nurses improve their professional awareness (Bergeron et al., 2006). Furthermore, allowing these heroic front-line medical staff to provide professional technical support for pandemic prevention to the public will help the public understand the disease and front-line staff, and eliminate misunderstandings and fears (Kim, 2018). Providing these health care professionals with medical insurance support also helps them to feel protected physically and psychologically (Sun et al., 2020). Such recognition and support are not only important for medical workers but also for their families (Bergeron et al., 2006; Kim, 2018; Sun et al., 2020).

'Online reviews say we are heroes… I really appreciate the people who care for and support me and I cherish this emotion'. (Sun et al., 2020)

'A lot of companies donated money and supplies to support our fight against the epidemic and I was very moved! Also actively paid for our antiepidemic health insurance; it feels like everyone is supporting us'. (Sun et al., 2020)

'Nurses have truly been heroes during this time, they have put themselves on the line for their clients and patients'; '…profound respect for those nurses who worked on the front lines in this crisis'. (Bergeron et al., 2006)

'We received a lot of relief goods. Elementary students sent us snacks and letters saying, "We'll cheer you up!" Those things encouraged me. I attached the letters to the refrigerator to encourage myself. Indwellers and other people wrote notes on a board in the front of the hospital and sometimes put ribbons. It helped me too'. (Kim, 2018)

4.2 | Need for more formal support

The theme of 'need for more formal support' describes negative factors experienced by nurses during a public health crisis that have adverse psychological and emotional impacts (Bergeron et al., 2006; Chung et al., 2005; Liu et al., 2020; O'Boyle et al., 2006; Sun et al., 2020). From this perspective, hospital management should identify factors involved in psychological support for nurses (Bergeron et al., 2006; Kim, 2018; Lee et al., 2020). Negative effects experienced by nurses included working in a high-anxiety environment owing to the risky nature of an epidemic, among other external factors (Bergeron et al., 2006; Chung et al., 2005; Sun et al., 2020).

4.2.1 | Factors affecting nurses' psychological well-being

Family members are undoubtedly an important factor affecting nurses' psychological well-being (Bergeron et al., 2006; Chung et al., 2005; O'Boyle et al., 2006; Sun et al., 2020). During a public health crisis, nurses at the front line risk their lives to take care of their patients. Family members worry about their safety and nurses worry that their family, especially older people and children, will be unattended (Sun et al., 2020). Nurses feel guilty separating from their family and not being able to accompany children, which can even affect their marriage (Bergeron et al., 2006; Chung et al., 2005; O'Boyle et al., 2006; Sun et al., 2020). All of these factors place a heavy psychological burden on nurses, and some report that the safety of their family is a prerequisite for being able to work effectively (O'Boyle et al., 2006).

The news of the infection or death of frontline health care staff or colleagues causes tremendous psychological harm to nurses. Not only is such an event sad for health care staff, but it also reflects the danger faced by nurses, who worry that they might encounter the same misfortune (Bergeron et al., 2006; Chung et al., 2005; Sun et al., 2020). The psychological strain is even more serious among frontline medical staff involved in direct patient care (Chung et al., 2005).

A nurse's mood can fluctuate according to their patients' condition. When a patient's condition does not improve or worsens, nurses may feel depressed and helpless (Liu et al., 2020; Sun et al., 2020). When a patient dies, the nurse may feel responsible for causing the patient and their family emotional distress and sadness (Liu et al., 2020; Sun et al., 2020). When nurses must prioritize medical needs, they often blame themselves for feeling that they have given up on their patients (Lee et al., 2020). In addition to their medical condition, if a patient has been in isolation for a long period owing to disease or illness, the patient may experience negative emotions (Kim, 2018). Such patients may vent their emotions to their nurse, and the patient's family may also express dissatisfaction with the nurse (Kim, 2018):

'One patient had a good personality. Every time he seemed very sick, I asked him, "Are you okay?" He

always said he was fine. He seemed to endure a lot. After a few days, his breathing became faster, and I notified the doctor. The doctor asked me to give him midazolam. I had to wait for the medicine in an isolated room. It took a long time. It was difficult to just watch my patient suffering. I couldn't stop crying'. (Kim, 2018)

'When I talk with patients who are recovering, I am more relaxed because the treatments are effective. But when patients have a persistent fever without obvious improvement or when their condition deteriorates, I am very depressed when I enter their room'. (Liu et al., 2020)

Participants reported experiencing various ethical conflicts, such as hesitation in providing care, restrictions of visits by guardians and the untimely death of patients (Lee et al., 2020). Many participants experienced pain caused by the desire to stop the spread of infection, and they cried bitterly over the death of a patient and their inability to provide humane care or allow patients to have their loving family around them (Lee et al., 2020). Additionally, the unfamiliar environment with special ward signs made nurses feel anxious and uneasy (Lee et al., 2020; Liu et al., 2020; Sun et al., 2020). Barriers to work caused by wearing protective equipment also caused nurses to be irritable (Liu et al., 2020):

'There was a man whose parents died on the same day. He cried beside his mother's bed and said his parents were previously healthy, but he lost both of them owing to this sudden disease. The scene was really painful, and I cried. For a few days, the critical and intensive care units had patients dying every day. I feel very depressed. When will it end?' (Liu et al., 2020)

4.2.2 | Anxiety among nurses at work

Owing to many unknowns during a pandemic, nurses can experience fear and uncertainty (Bergeron et al., 2006; Chung et al., 2005; Kim, 2018; Lee et al., 2020; Liu et al., 2020; Sun et al., 2020). Participants reported considerable negative energy at the start of a pandemic, especially when entering a special ward for the first time (Sun et al., 2020). In the beginning, there is no understanding regarding the mode of transmission of the new disease, no treatment plan, no vaccine and patients are dying. Participants experienced anxiety, fear and feelings of powerlessness because they were unable to care for patients in the face of the unknown (Bergeron et al., 2006; Chung et al., 2005; Kim, 2018; Lee et al., 2020; Liu et al., 2020; Sun et al., 2020):

'When I first came here, I felt that there were many hallways in the Department of Infectious Diseases. The environment was unfamiliar and my colleagues were also unfamiliar. The operating procedures and disease care routines were different from my previous work. I felt very anxious'. (Sun et al., 2020)

'I felt very depressed on the first day in the infectious disease hospital because there was only one entrance and passage for medical staff; it is an isolation unit with negative pressure. I felt it was difficult to breathe…this new environment brought a sense of oppression'. (Liu et al., 2020)

Frontline nurses at risk often feel that their lives are threatened, and they are very afraid of contracting a deadly infection when there are no drugs available to treat a novel pathogen (Chung et al., 2005; Kim, 2018; Lee et al., 2020; Liu et al., 2020; O'Boyle et al., 2006; Sun et al., 2020). Study participants often suspected that they were infected or exposed during the process of caring for patients, which led to anxiety (Lee et al., 2020). The first consideration for nurses is their own life and safety, and second, whether they will bring the virus home to their family owing to their work in the hospital (Bergeron et al., 2006; Liu et al., 2020; O'Boyle et al., 2006; Sun et al., 2020). In particular, nurses living at home with their family were worried about their family's safety (O'Boyle et al., 2006). Furthermore, nurses worried about whether they would accidentally infect other patients (O'Boyle et al., 2006).

When a nurse is caring for a patient in an isolation ward, the nurse may feel disconcerted, abandoned and alone (Kim, 2018). Some participants reported that after their experiences during the pandemic, they were affected by ongoing psychological trauma (Bergeron et al., 2006; Kim, 2018; Lee et al., 2020).

4.3 | Need to be treated fairly

The theme 'need to be treated fairly' refers to the unfair or forceful treatment of nurses during a pandemic, which causes them psychological harm. Hospitals and the public should provide support and care to frontline nurses and medical workers. However, participants reported psychological harm caused by unfair treatment by both hospitals and society (Bergeron et al., 2006; Chung et al., 2005; Kim, 2018; Shih et al., 2009).

4.3.1 | Hospital factors

At the beginning of a pandemic, to avoid large-scale panic, some hospital authorities have deliberately concealed the true nature of the disease from nurses and medical workers (Shih et al., 2009). Hospitals have also restricted shift nurse's freedom of movement, forbidding them to leave the hospital to go home after finishing work (Shih et al., 2009). With the development of the pandemic, hospitals have recruited nurses to work in dangerous areas to

care for infected patients. Although most nurses did so voluntarily, some were unprepared (Chung et al., 2005; Kim, 2018; Lee et al., 2020). Owing to cultural background, ethics and career continuity, unprepared nurses may be fearful but still agree to work under dangerous conditions (Chung et al., 2005; Kim, 2018; Lee et al., 2020):

> 'Early in the epidemic, some nurse clinicians and leaders reported to the media that authorities in their institutions had failed to honestly inform them of the presence of victims with SARS-related conditions or the risks involved in their care'.
>
> 'This was because nurses had not been informed of the true nature of this disease and they were forbidden to leave the hospital after their shift duties were completed'.(Shih et al., 2009)
>
> 'The superintendent at our hospital did not respond to our questions about this life-threatening disease, although we were the top nursing administrators in the hospital'.(Shih et al., 2009)
>
> 'I was so scared when I was given a proposal to go to the ward for patients with a definite diagnosis to work because the disease called MERS had never occurred in Korea; it was the first time. There are new things that I don't know so well. Why was this suggested to me? I made a phone call to my parents before answering.... I knew someone had to do it, but I thought a lot about why it should be me. I was really scared at first'. (Lee et al., 2020)

Nurses are under tremendous psychological pressure when they do not have medical insurance (Bergeron et al., 2006; O'Boyle et al., 2006; Shih et al., 2009). Nurses worry that if they or their family is infected, the hospital cannot provide them with support (O'Boyle et al., 2006). Nurses may also be laid off owing to the financial situation of the hospital (Shih et al., 2009).

4.3.2 | Social factors

In a pandemic, some people use social media tools to spread false information. During the early stages of a pandemic, some reports have appeared, with no evidence to support the claims made. Such rumours not only cause public panic but also place a great deal of psychological pressure on nurses (Chung et al., 2005; Shih et al., 2009). Because frontline nurses work in the most dangerous areas, they are very vulnerable to such false claims (Chung et al., 2005).

> 'They believed whatever they heard from the media, other colleagues, and friends. I was frustrated when staff did not fully comply with infection control procedures'. (Chung et al., 2005)

Stigma can deeply hurt nurses (Bergeron et al., 2006; Kim, 2018; Lee et al., 2020). In most places, the public has praised nurses highly for their contributions to a public health crisis and has celebrated them as heroes (Sun et al., 2020). However, because people worry that infectious diseases are highly contagious and lethal, they may be concerned that nurses working in hospitals will spread the disease to the community. Some communities have discriminated against nurses working in hospitals, preventing nurses who work the night shift from going home and barring nurses from social interaction (Bergeron et al., 2006; Kim, 2018; Lee et al., 2020). In addition to these actions against nurses themselves, social service agencies have also refused to provide services to nurses' relatives and have deliberately cut off contact with nurses and their family (Kim, 2018; Lee et al., 2020).

5 | DISCUSSION

5.1 | Discussion of the main findings

According to our review and thematic synthesis, the factors involved in the psychological support needed by nurses during a public health crisis can be divided into three themes: positive psychological drive, need for more formal support and need to be treated fairly.

The results of the current review provide a summary of nurses' experiences in hospital and community settings, focusing on the psychological support required by nurses in a public health emergency. Discussing the factors that affect nurses and how they feel about them may better provide all nurses with appropriate psychological support during a pandemic or public health emergency.

5.2 | Positive psychological drive

The first theme that emerged from our findings was 'positive psychological drive'. Similar studies have been conducted on reducing stress among nurses through exercise or mindfulness meditation (Cohen-Katz et al., 2005; Gu et al., 2020; Guillaumie et al., 2017; Lambert & Lambert, 2008; Lin et al., 2020; Mahon et al., 2017). Mindfulness and exercise not only have a positive effect in relieving nurses' depression, insomnia and anxiety owing to work-related stress, these approaches can also improve nurses' satisfaction with their work (Cohen-Katz et al., 2005; Gu et al., 2020; Guillaumie et al., 2017; Lambert & Lambert, 2008; Lin et al., 2020; Mahon et al., 2017). Therefore, in considering the psychological needs of nurses during a public health crisis, hospitals and organizations should develop courses and provide guidance to nurses because skills such as mindfulness and yoga are unfamiliar to some.

In this review, we also found that in terms of self-regulation, nurses can relieve stress by crying or talking with colleagues to help adjust to psychologically challenging circumstances (Shih

et al., 2009; Sun et al., 2020). However, nurses in different countries have different cultural backgrounds. In many non-Western cultures, people who cry are considered weak and may be ignored or even ostracized by society (Tseng, 2001). Additionally, non-westerners may show genuine affection for family members or closest friends (Liu et al., 2020; Shih et al., 2009). In the isolation environment of anti-pandemic, there are not many opportunities to face family members, also in order not to worry family members, some negative emotions may be endured by themselves and will not be expressed (Sun et al., 2020). Also, due to different cultural backgrounds, nurses in non-Western countries may be more introverted and not easy to express themselves directly, unlike in Western countries. In non-Western countries, nurses should be allowed to vent their inner feelings and managers should provide them with guidance, but without judgement (Prompahakul & Epstein, 2020). Although hospitals are aware of providing psychological support, they should provide effective and acceptable psychological support methods according to different cultural backgrounds (Zhang, 1995).

We found that nurses' sense of professionalism and responsibility guided their inner beliefs and helped them to overcome their fears (Kim, 2018; Lee et al., 2020; Sun et al., 2020). Nurses believe that caring for patients during a public health crisis is the right thing to do, which underlies their commitment to the nursing profession (Hewlett & Hewlett, 2005). In addition to beliefs derived from the mission of the nursing profession, we found that nurses with strong religious beliefs often relied on their beliefs to combat adverse psychological effects (Bahrami et al., 2016; Perera et al., 2018; Shih et al., 2009). Therefore, it is possible to strengthen professional beliefs among nurses in their daily work and encourage nurses with religious beliefs to share their feelings, which can help these health professionals to improve their ability to resist stress in extreme situations.

Effective psychological support does not only arise from nurses themselves, effective external psychological support is also important. Spiritual support and physical support, and the support of family members for nurses, were emphasized in several studies (Lee et al., 2020; Liu et al., 2020; Shih et al., 2009; Sun et al., 2020).

The findings of this review showed that during a public health crisis, a harmonious working atmosphere among colleagues can effectively lessen the negative psychological effects on nurses and increase their work engagement (Ives et al., 2009; Liu & Liehr, 2009). People can meet their psychological needs by receiving praise, affirmation and understanding (Wang et al., 2020). Nurses can largely satisfy their psychological needs when they receive praise from patients and the public for their work during a crisis (Bergeron et al., 2006; Chung et al., 2005; Kim, 2018; Lee et al., 2020; Liu et al., 2020; Sun et al., 2020).

The government and hospitals have resources to provide online psychological support for health care providers, but most nurses only watch videos or read introductions and do not use online psychological counselling resources (Liu et al., 2020; Sun et al., 2020). Psychological support that is consistent with nurses' cultural background should be provided.

5.3 | Need more formal support

Managers should pay greater attention to nurses' psychological responses and design and implement appropriate intervention measures when a nurse experiences negative emotions (Adams et al., 2019). Additionally, leaders should communicate directly with nurses and encourage them at work and allow them to express their emotional needs so that they feel cared for and valued (Adams et al., 2019). According to Maslow's theory, the most basic needs of human beings are physiological and safety needs (Abulof, 2017). Once nurses have their basic needs met, they will have the motivation to meet further needs. Therefore, managers should ensure work-related safety support, such as providing protective equipment and corresponding training for frontline nurses. Nurses with low seniority have less experience in dealing with disaster situations or infection control measures when they face this type of work, so they are under more pressure than nurses with greater seniority (Lee et al., 2020). Therefore, care managers could pay close attention to this group.

5.4 | Need to be treated fairly

Although most people express respect and support for the dedication of nurses during a public health emergency, some unfair treatment has occurred in some countries (Bergeron et al., 2006; Chung et al., 2005; Kim, 2018; Lee et al., 2020; O'Boyle et al., 2006; Shih et al., 2009).

Today's social media applications provide convenience and enrich life for the public (Huang & Miao, 2020). Due to the public's prejudice and fear of disease, some negative rumours were spread (Chung et al., 2005; Shih et al., 2009). The masses use self-media to disseminate negative opinions and speculations about front-line healthcare staff unsupported remarks caused some people to disseminate and refuse to contact nurses and their families (Bergeron et al., 2006; Chung et al., 2005; Kim, 2018; Lee et al., 2020; Shih et al., 2009). The conflicting and often confusing information received by nurses exacerbates fear and also makes the nurse feel angry, guilty and suspicious of their profession and it became a psychological burden for nurses. To prevent the panic from spreading, hospitals in some areas conceal the nature of the epidemic from nurses (Shih et al., 2009). Nurses have had to be quarantined in hospitals for long periods of time due to shortages of medical facilities and staff to cope with the high volume of front-line care. This social distancing deprives nurses of social support at work and increases work-related stress, with social restrictions weakening nurses' social relationships while contributing to stigma against nurses (Kim, 2018). Evidence suggests that accurate information from public health authorities can reduce the potential stigma and fear fostered by the media (Shih et al., 2009).

For nurses recruited to the front line, it seems that the hospital's arrangements cannot be rejected (Chung et al., 2005; Kim, 2018). On the one hand, due to culture and politics, nurses may find it difficult to refuse unwilling things (Chung et al., 2005; Kim, 2018). Although

most nurses voluntarily go to the front line to take care of infected patients, some are designated by hospitals and they may have unique advantages in management or technology. In this situation, the nurses seem unable to refuse the request of the hospital and the government. This would have a massive impact on psychological well-being as people are being forced to look after infectious patients. On the other hand, epidemics (such as COVID-19) have caused national and even global disasters. Nurses are known as 'anti-epidemic heroes' in many countries and regions, creating an image that nurses are obliged to take care of others (Zhang et al., 2020). This also seems to be the reason why it is difficult for nurses to refuse recruitment.

The government and hospitals can help nurses to minimize their psychological burden. Nurses should also be provided with insurance support so that they and their families do not have to worry about becoming ill.

5.5 | Limitations

In this qualitative systematic review, we explored the psychological impact and support needs of nurses during a public health emergency. This review included 10 studies from multiple countries. Owing to the different sociocultural and political backgrounds among countries, our findings provide an international perspective, which may contribute to improving the global understanding of nurses' psychological needs during a public health crisis. However, we only included research published in English, so insights and knowledge published in other languages may have been omitted. Furthermore, because women account for a large proportion of nursing professionals and more women were included in the study than men, the results may not fully represent the psychological needs of male nurses.

6 | CONCLUSIONS

In this paper, we described the factors involved in effective psychological support for nurses but that have not received serious consideration, including: (1) positive psychological drive (inner positive support, positive external support), (2) need for more formal support (factors affecting nurses' psychological well-being, nurses working with anxiety) and (3) need to be treated fairly (hospital factors, social factors). To explore the experience of nurses caring for patients during a pandemic, our study showed that during such a crisis period, in addition to physical fatigue, nurses can experience severe and lasting psychological effects. Our results support previous findings regarding nurses' experiences in caring for patients during a serious public health event. Furthermore, the results elucidate those factors that affect nurses' psychological well-being during this type of period and the type of psychological support needed by these health professionals. Owing to cultural and organizational differences, some nurses and organizations may fail to properly understand and use suitable interventions, which may lead to psychological problems among nurses that can gradually become more serious. This is detrimental to the health of nurses and directly affects the care of patients, making this an urgent issue. We found that nurses often work hard to adjust their mental state on their own. Factors like religion, meditation, mindfulness, hobbies and certain psychological approaches can effectively provide them with the necessary support. Family members are the main source of support for individuals in dealing with stress, and worry about family members can also be a source of negative psychological effects among nurses. Support and cooperation from colleagues can alleviate nurses' fears and make them feel that they can rely on each other. Receiving the understanding of patients is another source of strong psychological support among nurses. However, hospitals and society remain inadequate in supporting nurses and have even engaged in unfair treatment in some cases. Therefore, the psychological needs of nurses during a public health crisis must be prioritized to establish an effective, culturally appropriate, formal support system.

In this study, only nurses were included. Because other health care workers are involved during a pandemic, it would be useful to examine the psychological impacts on these individuals and differences in the psychological needs between male and female nurses, and the views and understanding of psychological problems among nurses with different cultural backgrounds.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

ETHICS STATEMENT

No Research Ethics Committee approval was sought as this is a literature review paper.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study, are available from the corresponding author upon reasonable request.

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APPENDIX 1

Searching strategy in MEDLINE.

#	Query	Limiters/expanders	Last run via	Results
S49	S10 AND S31 AND S47 AND S48	Expanders - apply Related words, apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	333
S48	Qualitative research	Expanders - apply Related words, apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	72,119
S47	S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46	Expanders - apply Related words, apply Equivalent subjects Search modes Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	3,101,300
S46	Work experience"	Expanders - apply Related words, apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	11,936
S45	Job experience	Expanders - apply Related words, apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	1423

#	Query	Limiters/expanders	Last run via	Results
S44	Life expense	Expanders - apply Related words, apply Equivalent subjects Search modes Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	16,090
S43	VIEW*	Expanders - apply Related words, apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	475,428
S42	Feeling*	Expanders - apply Related words, apply Equivalent subjects search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen – Advanced Search Database - MEDLINE	94,603
S41	Experience*	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	1,069,334
S40	Attitude*	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	449,167
S39	Demands	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	230,110
S38	Supports	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	1,240,028
S37	Support needs	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	30,484
S36	Mental health support	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	5181
S35	Psychological support	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	34,237
S34	Lack of support	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	14,841
S33	Support for nurses	Expanders - apply Related words; apply equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	13,305

#	Query	Limiters/expanders	Last run via	Results
S32	Emotional support	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	10,073
S31	S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30	Expanders - apply related words; apply equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	644,742
S30	Public health emergencies	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	4463
S29	Infectious diseases	Expanders - apply related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	377,475
S28	Severe acute respiratory syndrome coronavirus 2	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	2505
S27	Severe acute respiratory syndrome	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	13,031
S26	SARS virus	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	4054
S25	SARS	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	48,998
S24	Pandemic influenza	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	11,660
S23	Swine flu	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	21,451
S22	Novel influenza A	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	2193

#	Query	Limiters/expanders	Last run via	Results
S21	Middle east respiratory syndrome	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	2428
S20	MERS	Expanders - Apply related words; Apply equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	12,768
S19	coronavirus	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	32,599
S18	COVID-19	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	27,842
S17	Pandemic response	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	1656
S16	CORONAVIRUS INFECTIONS	Expanders - Apply related words; Apply equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen – Advanced Search Database - MEDLINE	17,288
S15	H1N1	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	21,451
S14	Disease outbreaks	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	96,565
S13	Epidemic*	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	150,453
S12	Pandemic outbreak	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	1445
S11	Pandemic	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	44,741
S10	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	855,465

#	Query	Limiters/expanders	Last run via	Results
S9	Nurse manager	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	6781
S8	Nurse leader	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	3346
S7	Head nurse	Expanders - apply Related words; apply equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	1566
S6	Nurs*	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	I Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	855,465
S5	Registered nurses	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	13,241
S4	Practical nurses	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	2142
S3	Nursing staff	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	105,493
s2	Nursing	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	729,680
S1	Nurses	Expanders - apply Related words; apply Equivalent subjects Search modes Boolean/phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - MEDLINE	353,030

APPENDIX 2

CASP qualitative checklist.

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Summertown Pavilion, Middle Way Oxford OX2 7LG

CASP Checklist: 10 questions to help you make sense of a **Qualitative** research

How to use this appraisal tool: Three broad issues need to be considered when appraising a qualitative study:

- Are the results of the study valid? (Section A)
- What are the results? (Section B)
- Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA 'Users' guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Qualitative) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

CASP
Critical Appraisal Skills Programme

Paper for appraisal and reference:

Section A: Are the results valid?

1. Was there a clear statement of the aims of the research?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- what was the goal of the research
- why it was thought important
- its relevance

Comments:

2. Is a qualitative methodology appropriate?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants
- Is qualitative research the right methodology for addressing the research goal

Comments:

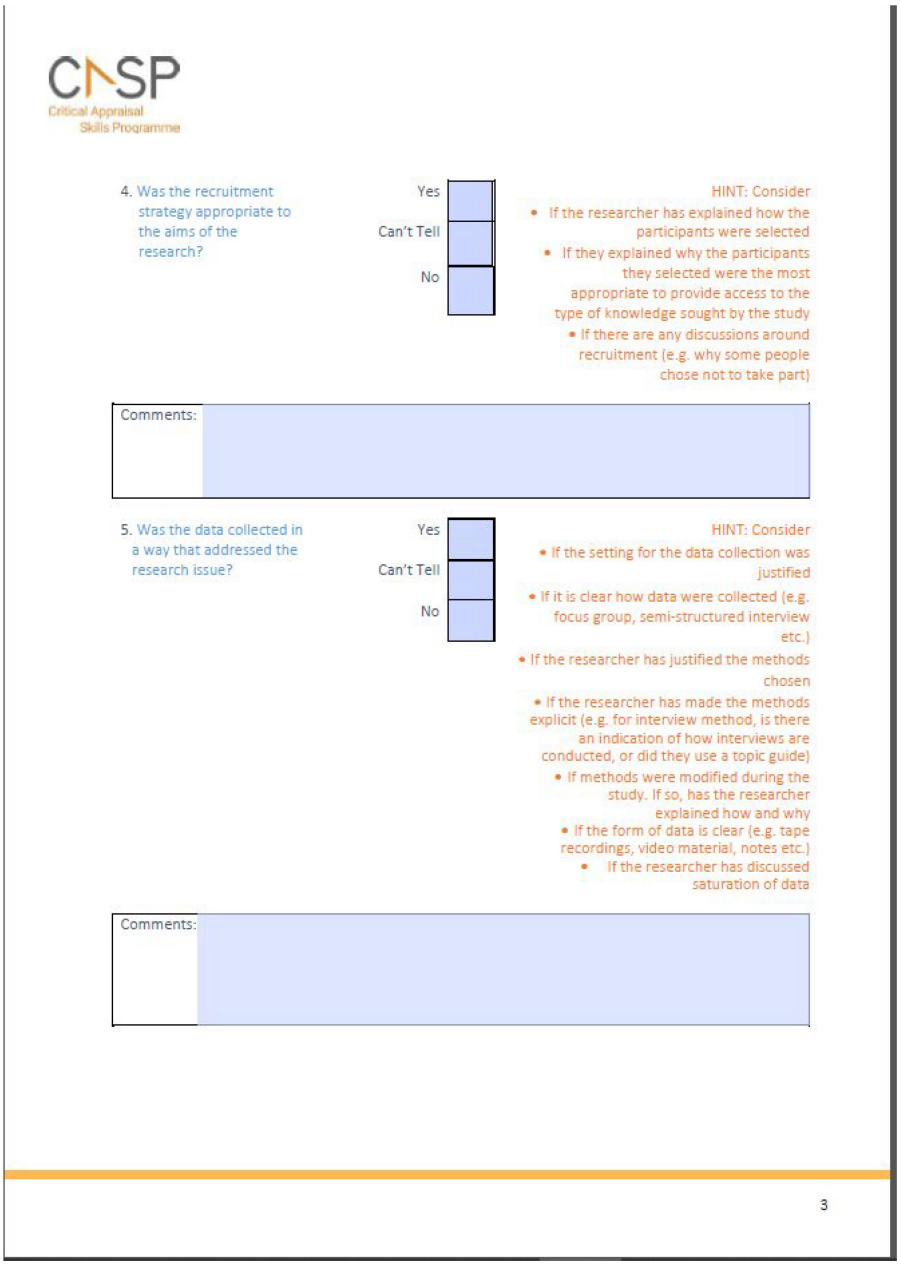
Is it worth continuing?

3. Was the research design appropriate to address the aims of the research?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- if the researcher has justified the research design (e.g. have they discussed how they decided which method to use)

Comments:



CASP
Critical Appraisal Skills Programme

4. Was the recruitment strategy appropriate to the aims of the research?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If the researcher has explained how the participants were selected
- If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study
- If there are any discussions around recruitment (e.g. why some people chose not to take part)

Comments:

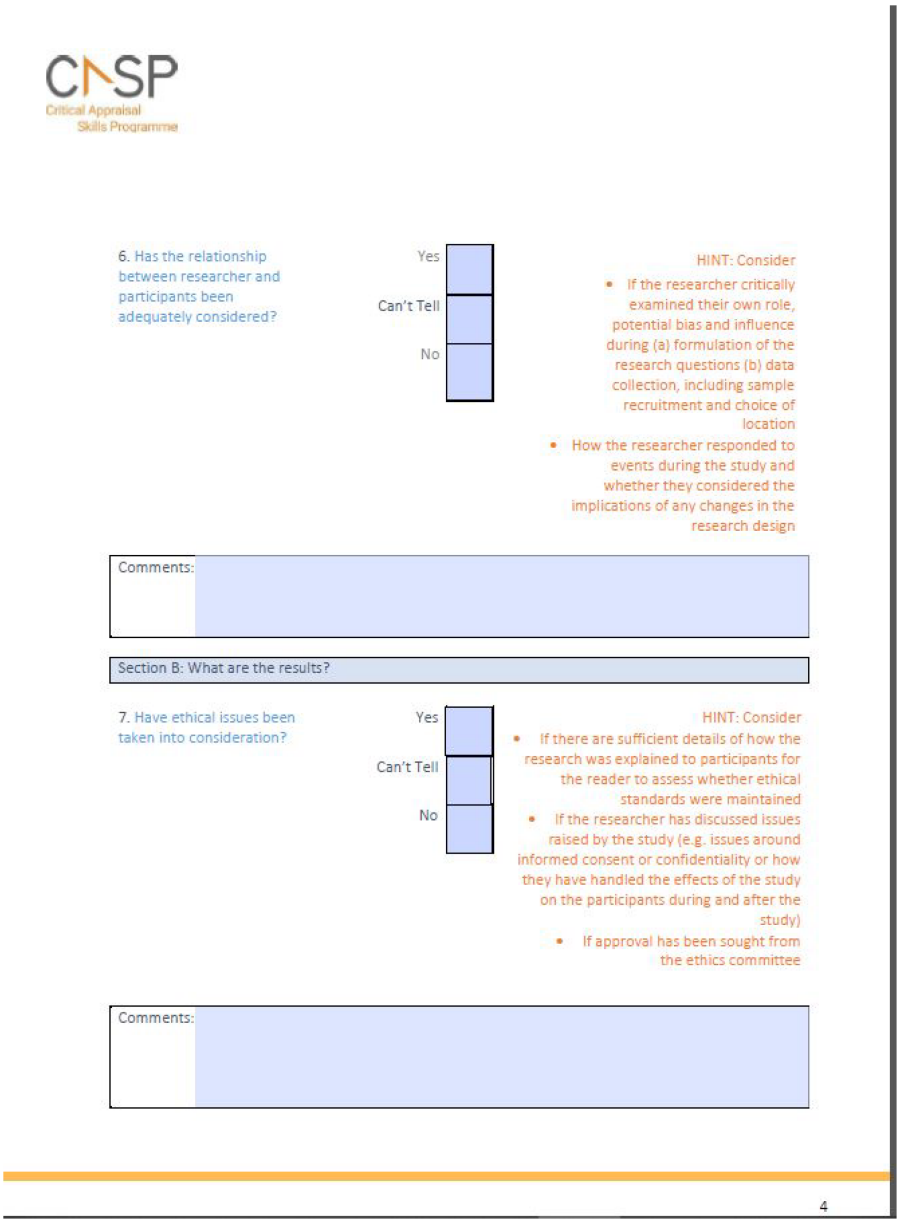
5. Was the data collected in a way that addressed the research issue?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If the setting for the data collection was justified
- If it is clear how data were collected (e.g. focus group, semi-structured interview etc.)
- If the researcher has justified the methods chosen
- If the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews are conducted, or did they use a topic guide)
- If methods were modified during the study. If so, has the researcher explained how and why
- If the form of data is clear (e.g. tape recordings, video material, notes etc.)
- If the researcher has discussed saturation of data

Comments:

3



CASP
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6. Has the relationship between researcher and participants been adequately considered?

Yes
Can't Tell
No

HINT: Consider
- If the researcher critically examined their own role, potential bias and influence during (a) formulation of the research questions (b) data collection, including sample recruitment and choice of location
- How the researcher responded to events during the study and whether they considered the implications of any changes in the research design

Comments:

Section B: What are the results?

7. Have ethical issues been taken into consideration?

Yes
Can't Tell
No

HINT: Consider
- If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- If the researcher has discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)
- If approval has been sought from the ethics committee

Comments:

4

CASP
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8. Was the data analysis sufficiently rigorous?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- If there is an in-depth description of the analysis process
- If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data
- Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process
- If sufficient data are presented to support the findings
- To what extent contradictory data are taken into account
- Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation

Comments:

9. Is there a clear statement of findings?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- If the findings are explicit
- If there is adequate discussion of the evidence both for and against the researcher's arguments
- If the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)
- If the findings are discussed in relation to the original research question

Comments:

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Section C: Will the results help locally?	
10. How valuable is the research?	HINT: Consider • If the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g. do they consider the findings in relation to current practice or policy, or relevant research-based literature • If they identify new areas where research is necessary • If the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used
Comments:	

APPENDIX 3

Characteristics of the included studies form.

Author Study Year	Country and language setting	Aim	Design	Sample Participants Characteristics	Data collection and analysis	Outcomes