







Review article

Portraying nurses' professional performance in COVID-19 Intensive Care Units: an integrative review

Retrato da atuação profissional das enfermeiras em unidade de terapia intensiva COVID-19: revisão integrativa

Descripción del desempeño profesional de las enfermeras en Unidades de Cuidados Intensivos exclusivas para COVID-19: revisión integradora

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Abstract

Objective: to analyze and integrate diverse scientific evidence about the knowledge produced in terms of care, occupational, physical and emotional health by nurses working in a COVID-19 Intensive Care Unit. **Method:** an integrative literature review conducted in March 2022 in PubMed, Excerpta Medica Database, Scopus, Web of Science, Cumulative Index to Nursing & Allied Health Literature and *Biblioteca Virtual da Saúde*. **Results:** the data extracted from 39 articles were integrated into three topics: Nurses' physical and emotional in the Intensive Care Unit; Occupational health of COVID-19 Intensive Care Unit workers; and The Nursing care revolution in COVID-19 times. **Conclusion:** during the COVID-19 pandemic, the nurses working in Intensive Care Units were exposed to extended workdays and inadequate working conditions. They worked seeking new technologies to promote care and also as advocates of the patients' rights.

Descriptors: COVID-19; Nursing Care; Nursing; Occupational Health; Intensive Care Units

Resumo

Objetivo: analisar e integrar as evidências científicas acerca do conhecimento produzido em termos de cuidado, saúde ocupacional, física e emocional por enfermeiras que atuam em Unidade de Terapia Intensiva COVID-19. **Método:** revisão integrativa de literatura realizada no *PubMed*, *Excerpta*

Medica Database, Scopus, Web of Science, Cumulative Index to Nursing & Allied Health Literature e na Biblioteca Virtual da Saúde, em março de 2022. **Resultados:** os dados extraídos de 39 artigos foram integrados em três temas: a saúde física e emocional das enfermeiras na unidade de terapia intensiva; a saúde ocupacional dos trabalhadores das unidades de terapia intensiva COVID-19; a revolução no cuidado de Enfermagem em tempos de COVID-19. **Conclusão:** durante a pandemia da COVID-19, enfermeiras atuando em unidades de terapia intensiva foram expostas a longas jornadas e condições inadequadas de trabalho. As enfermeiras atuaram buscando novas tecnologias para promover o cuidado e também como defensoras dos direitos dos pacientes.

Descritores: COVID-19; Cuidados de Enfermagem; Enfermagem; Saúde Ocupacional; Unidades de Terapia Intensiva

Resumen

Objetivo: analizar e integrar las evidencias científicas acerca del conocimiento producido en términos de atención, salud ocupacional, física y emocional por enfermeras que trabajan en Unidades de Cuidados Intensivos exclusivas para COVID-19. **Método:** revisión integradora de la literatura realizada en *PubMed, Excerpta Medica Database, Scopus, Web of Science, Cumulative Index to Nursing & Allied Health Literature* y en la Biblioteca Virtual da Salud, en marzo de 2022.

Resultados: los datos extraídos de 39 artículos se integraron en tres temas: Salud física y emocional de las enfermeras en la Unidad de Cuidados Intensivos; Salud ocupacional de los trabajadores de las Unidades de Cuidados Intensivos exclusivas para COVID-19; y Revolución en la atención de Enfermería en tiempos de COVID-19. **Conclusión:** durante la pandemia de COVID-19, las enfermeras que trabajan en Unidades de Cuidados Intensivos se vieron expuestas a extensas jornadas laborales y a condiciones inadecuadas de trabajo. Se preocuparon por buscar nuevas tecnologías para promover la atención y también se desempeñaron como defensoras de los derechos de los pacientes.

Descritores: COVID-19; Atención de Enfermería; Enfermería; Salud Laboral; Unidades de Cuidados Intensivos

Introduction

The COVID-19 pandemic imposed unprecedented challenges on nurses working on the front lines in different health organizations, which had to adapt to changing conditions in the health sector.¹ The challenges facing the pandemic were countless, such as scarcity of material resources and trained professionals to meet the health system demands, resulting in unprepared and stressed-out teams. Additionally, due to the severity of the patients affected by COVID-19, the demand for Intensive Care Unit (ICU) beds was increased, which resulted in new units being created and converted for the treatment of COVID-19 patients.²

Although the pandemic has directly or indirectly affected all health professionals, ICU nurses were the most affected globally in terms of stress and mental health. This high impact on ICUs was attributed to the fact of caring for critically-ill patients without resources such as Personal Protective Equipment (PPE) and to the insufficient number of qualified professionals to meet the demand of overcrowded ICUs.^{3,7} Such challenges made ICU nurses adapt in an emergency way to overcrowding of the units, creating emergency protocols, establishing new care techniques and carrying out staff resizing and professional training.

Complex and diversified care for people infected with COVID-19, in addition to other demands of the health system, became an everyday difficulty for nurses working in ICUs.⁸ Intensivists around the world presented physical and psychological exhaustion during and after their work in the pandemic as consequences, with high prevalence of anxiety,

depression, post-traumatic distress, and what many experts called “Pandemic Burnout” due to physical and mental exhaustion in these professionals.⁹

In view of such considerations, it is deemed important to carry out this study whose objective was to analyze and integrate the diverse scientific evidence about the knowledge produced in terms of care, occupational, physical and emotional health by nurses who work in a COVID-19 Intensive Care Unit.

Method

An integrative literature review¹⁰ with its guiding question formulated following the PICO strategy,¹¹ acronym for Population (Nurses), Phenomena of Interest (COVID-19 Pandemic), and Context (ICUs): How do nurses working in Intensive Care Units or Centers are portrayed in Nursing studies about the COVID-19 pandemic?

The inclusion criteria defined were the following: (1) articles published in English, Portuguese or Spanish; (2) related to nurses' role in Nursing care in COVID-19 ICUs; and (3) authored by at least one nurse. This review considered experimental and quasi-experimental studies, observational studies (prospective and retrospective cohorts), case-control studies, qualitative studies (including, but not limited to, phenomenological studies, Grounded Theory, ethnography, descriptive research and others). The exclusion criteria were as follows: (1) editorials, experience reports, reviews, reflection articles and essays.

The data were collected from the organization of a protocol, under validation by a librarian at the Federal University of Santa Catarina (*Universidade Federal de Santa Catarina*, UFSC), using the “Nursing”, “Intensive Care Units” and “COVID-19” DeCS/MeSH descriptors, and combining the terms by means of the *OR* and *AND* Boolean Operators, with an example of the strategy adopted shown in Table 1 (this strategy was adapted for the other databases). The search was conducted in March 2022 in the following bibliographic databases: PubMed, Excerpta Medica Database (Embase), Scopus, Web of Science, Cumulative Index to Nursing & Allied Health Literature (CINAHL) and *Biblioteca Virtual da Saúde* (BVS).

Chart 1 - Literature search strategy, Florianópolis, SC, Brazil, 2022.

Database	Search strategy
PUBMED; EMBASE; SCOPUS; WEB OF SCIENCE; CINAHL	"Nursing" OR "Nurses" OR "Nurse" OR "Nursing Care" AND "Intensive Care Units" OR "Intensive care" OR "ICU" OR "Intensive care unit" AND (("COVID-19" OR "Covid 19" OR "Covid19" OR "Covid-2019" OR "Covid 2019" OR "Covid 2019" OR "2019 nCoV" OR "2019-nCoV" OR "2019nCoV" OR "Coronavirus Disease-19" OR "Coronavirus Disease 19" OR "Coronavirus Disease-2019" OR "Coronavirus Disease 2019" OR "Novel Coronavirus" OR "New Coronavirus"

The records found were managed in EndNote X9[®] and duplicates were removed. The titles and abstracts were analyzed by three independent reviewers to define eligibility in relation to the inclusion criteria and, subsequently, the studies were read in full applying

the double-blind technique and, in case of opinion divergences, a fourth reviewer was in charge of making the final decision.

After the full reading of the articles selected, a form was organized to collect data referring to the following: study objectives, research questions, characteristics of the participants, method, main results and relevant conclusions for the review. The level of evidence of the studies included followed the assessment for effectiveness.¹² Choice of this classification was justified by the focus on the evaluation of quantitative and qualitative studies, respectively, regarding the inclusion of both methodological designs in this review. The articles included were organized in a *Microsoft Excel* file. Chart 2 presents the description of the results with the country and level of evidence corresponding to each of the articles.

Chart 2 - Level of evidence of the articles included according to the JBI effectiveness classification, Florianópolis, SC, Brazil, 2022.

Country/Reference	Classification	Level of Evidence
Sweden ¹³	Significance	3
Turkey ¹⁴	Effectiveness	4b
Greece ¹⁵	Effectiveness	4b
United States of America ¹⁶	Significance	2
India ¹⁷	Effectiveness	4b
China ¹⁸	Effectiveness	4b
Iran ¹⁹	Significance	3
United States of America ²⁰	Significance	3
Netherlands ²¹	Effectiveness	4b
Turkey ²²	Significance	3
Nepal ²³	Effectiveness	4b
Japan ²⁴	Effectiveness	4b
United States of America ²⁵	Effectiveness	4b
Philippines ²⁶	Significance	3
Spain ²⁷	Significance	3
England ²⁸	Effectiveness	4b
Italy ²⁹	Significance	3
Spain ³⁰	Effectiveness	4b
Spain ³¹	Significance	3
China ³²	Significance	3
United States of America ³³	Significance	3
Brazil ³⁴	Significance	3
Brazil ³⁵	Significance	3
Turkey ³⁶	Effectiveness	4b
Australia ³⁷	Effectiveness	4b
Iran ³⁸	Significance	3
Ireland ³⁹	Significance	3
Canada ⁴⁰	Effectiveness	4b
Switzerland ⁴¹	Significance	3
Brazil ⁴	Significance	3
Turkey ⁴²	Effectiveness	1c
Iran ⁴³	Effectiveness	1c
Iran ⁴⁴	Significance	3
Iran ⁴⁵	Effectiveness	1c

Brazil ⁴⁶	Significance	3
Brazil ⁴⁷	Significance	2
Singapore ⁴⁸	Significance	3
Netherlands ⁴⁹	Significance	3
Turkey ⁵⁰	Significance	3

Data analysis and synthesis involved three interactive phases: (a) the topics were sorted and categorized according to their focus;¹⁰ (b) categorization was achieved by identifying related words or phrases for the frequent and recurrent descriptive synthesis;³¹ and (c) inductive coding was performed to identify new relevant topics for the review. The topics were collaboratively verified by two of the authors and presented in a schematic way.

Results

The search for the results yielded 3,840 records and, after removing duplicates, 2,326 articles remained for evaluation, of which 39 were included in the review (Figure 1). Most of the 39 articles included are from Brazil (n=5), Iran (n=5) and Turkey (n=5); followed by the United States of America (USA) (n=4), China (n=3), Spain (n=2), Netherlands (n=2) and Sweden (n=2); in addition, Australia, Canada, Philippines, Greece, India, England, Ireland, Italy, Japan, Nepal and Singapore had one article each. The articles were published in 2021 (n=25), 2022 (n=10) and 2020 (n=4). Considering the methodological characteristics, qualitative studies (n=23) stand out, followed by quantitative (n=15) and mixed-methods (n=1) ones, and the participants were nurses (n=37) and family members (n=2). The qualitative studies grounded their discussion on theoretical frameworks such as the following: Phenomenology (n=8); Theory of Basic Needs (n=1); Person-Centred Practice (n=1); Flannagan's Critical Theory (n=1); and Narrative Inquiry (n=1). The other 27 studies did not indicate the theoretical framework used.

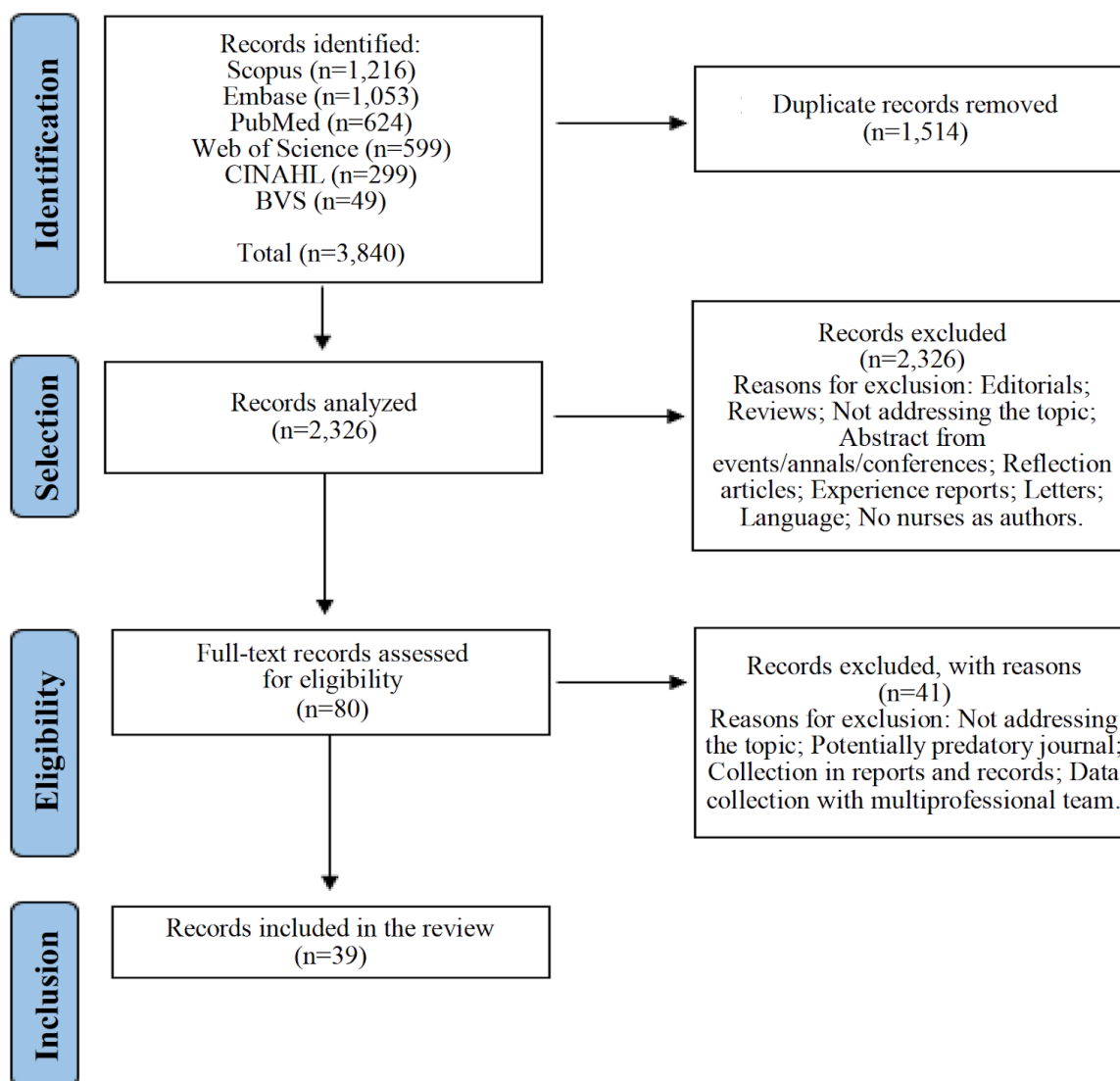


Figure 1 - Flowchart corresponding to the literature searches and selection, Florianópolis, SC/Brazil, 2022.

After analyzing the data found in the different studies of this review, they were synthesized into three topics and one subtopic (Chart 3), entitled as follows: (1) "Nurses' physical and emotional health in the ICU"; (2) "Occupational health of COVID-19 ICU workers" with the subtopic called "The challenge of Personal Protective Equipment"; and (3) "The Nursing care revolution in COVID-19 times".

Chart 3 - Objectives and synthesis of the main results from the studies included in the sample, Florianópolis, SC/Brazil, 2022.

Objective	Main results
TOPIC 1	Nurses' physical and emotional health in the ICU
To shed light on the experiences of anesthetist nurses working in ICUs during the COVID-19 pandemic. ¹³	The participants experienced ambivalent feelings and uncertainties before working in the ICU. After familiarizing with the ICU environment and continued work, they

	underwent valuable experiences and a feeling of belonging to the work environment. They also felt insecure due to the limited knowledge about the virus and how it spread.
To determine the stress, anxiety, depression and insomnia levels among ICU nurses through a structural equation model. ¹⁴	Most front-line ICU nurses experienced stress, anxiety, depression and insomnia at levels ranging from moderate to extremely severe; in addition to that, it was determined that there is a positive relationship between stress, anxiety, insomnia and depression.
To investigate moral distress and its effects on the ICU Nursing team, their professional quality of life and related factors. ¹⁵	Mental distress in ICU is intense, with contributing factors such as gender, the Nursing role, age and years of experience. A positive correlation was found between nurses' moral distress and professional quality of life.
To investigate the experiences underwent by ICU nurses that provided care to COVID-19 patients in order to understand and describe the stressful experiences. ¹⁶	Many negative emotions in the participants' lives when providing care to COVID-19 patients, such as sadness, concern, sorrow, fear and anger. Nurses proved to be disappointed for risking their health and their families' when providing care to COVID-19 patients. Revolt against the fact that some people ignored the social distancing guidelines.
To explore the mental health adverse results and the resilience of front-line nurses providing care to COVID-19 patients. ¹⁷	Adverse psychological outcomes with anguish (68.5%), anxiety (54.7%), fear (44%) and insomnia (31%) symptoms were verified. ICU nurses that provide care to COVID-19 patients showed high resilience levels, with a mean score of 31.23 ± 4.68 (out of 40).
To quantify the severity of nurses' post-traumatic stress symptoms and stress and to explore the factors that influence their psychological health when caring for COVID-19 patients. ¹⁸	Even highly qualified and resilient nurses experienced some degree of mental distress, such as post-traumatic stress symptoms. The importance of helping and training nurses to be resilient was verified. Nursing leaders are essential to provide adequate PPE, flexible work shift, and an attentive and healthy work environment. Nurses are the main pillar of health care and in preserving mental and psychological health.
To explore the protective reactions of ICU nurses that provide care to COVID-19 patients. ¹⁹	Balanced self-protection responses in care provision, even self-protection regardless of COVID-19 and obsessive protection against COVID-19. Taking care of the patients became a mental and behavioral obsession, regardless of whether protection principles were observed or not. Many nurses started to buy their own PPE items, considering the workplace limitations.
To explore the experiences of ICU nurses working in the central area of Texas in the midst of the pandemic. ²⁰	Anxiety and/or stress, fear, helplessness, concern and empathy symptoms were manifested. The emotion sources include contracting and/or transmitting the virus, knowledge deficit and isolated environment. The physical symptoms were as follows: headache and sleep disorders in all the participants.
To determine the impact cause by the first COVID-19 outbreak (March/June 2020) on mental well-being and associated risk factors among ICU nurses. ²¹	The prevalence values for anxiety, depression and post-traumatic stress symptoms were 27.0%, 18.6% and 22.2%, respectively. The first COVID-19 wave exerted a significant impact on the mental well-being of Dutch ICU nurses at risk of leaving their job, compromising care continuity.
To assess the experiences of nurses providing intensive care to COVID-19	Reports of negative emotions such as "stress, fear, anxiety, pessimism, tiredness, nervousness, despair, tension,

patients in Turkey. ²²	curiosity, sadness, incompetence, resentment and loneliness" when caring for COVID-19 patients.
To study the comparative prevalence of anxiety and depression, and their contributing factors, among nurses working in ICUs with COVID-19 patients and nurses working in other ICUs. ²³	Very high prevalence of psychiatric cases (85.4%) among all the nurses. The prevalence of anxiety and depression in ICU nurses during the pandemic is very high when compared to the value in the general population before the pandemic.
To examine the protective effect of ICU nurses' good social support in mental health during the COVID-19 pandemic. ²⁴	Social support was not associated with post-traumatic stress symptoms. Anxiety and depression were more frequent in women. More social support was associated with lower prevalence of anxiety and depression.
To describe ICU nurses' experiences during the COVID-19 pandemic in USA. ²⁵	Only 17.9% of the participants felt totally supported by the hospital management during the pandemic. They describe extreme patience and empathy towards ICU patients. Reports of helplessness when taking care of critically-ill COVID-19 patients.
To explore the experience of Philippine nurses working in COVID-19 ICUs abroad. ²⁶	Feeling of anxiety for being in a new sector and due to fear of contracting the disease. It is uncomfortable to wear many PPE layers for extended periods of time. Harms in the quality of the care provided to ICU patients, as they spend less time with them, in order to limit their exposure.
To explore and describe the experiences and perceptions of nurses working in an ICU during COVID-19. ²⁷	In addition to the physical consequences, such as work overload, emotional and mental difficulties were indicated. High stress levels that are inversely proportional to good working conditions. COVID-19 generated anxiety and fear, both in professionals and in patients.
To identify and characterize the problems that intensify or alleviate nurses' concerns during the first COVID-19 wave. ²⁸	Change in the usual role. Family support as a protective agent against stress; however, the pandemic proved to be a psychological risk factor. Concern about their own mental health, asserting that they are physically and emotionally exhausted. Informal support networks were accessed periodically during the pandemic.
To describe the experiences of Italian nurses urgently and compulsorily allocated to a recently created Sub-ICU for COVID-19. ²⁹	It was a major challenge to learn how to care for COVID-19 patients without the necessary time to prepare themselves personally and professionally; the nurses felt mixed emotions and a feeling of professional unpreparedness.
To investigate the Post-Traumatic Stress symptoms and causes among ICU nurses providing treatment for pneumonia due to COVID-19. ³⁰	Sleepiness and fatigue were verified in the night shift. Sleepiness and dyspnea were observed in Cluster A; cephalgia and nausea in Cluster B; and xerostomy in Cluster C, as well as stress-induced discomfort and palpitations.
TOPIC 2	Occupational health of COVID-19 ICU workers
To know the Nursing professionals' experience in the care of people infected by the coronavirus in the ICU. ³¹	The changes in the work routine and in the way to provide care were accompanied by a profound mental distress experience, configuring themselves as "second victims" of the pandemic. The presence and companionship of patients and family members acquired a special meaning for the Nursing professionals, turning into a way to mitigate distress.
To analyze ICU nurses' experiences when providing care to COVID-19 patients and to understand their	Contradictory feelings when they had never worked in an ICU. Working in the front line is considered a privilege. Concern about being infected, with PPE shortage and

everyday experiences in patient management. ³²	insecurity about the protection.
To explore the experience underwent by two intensivists nurses while providing care to COVID-19 patients during the pandemic. ³³	Strong commitment by the critical care nurses in providing ideal assistance to COVID-19 patients. Despite the difficulties, they expected that a future pandemic would be easier to deal with.
To describe the adversities experienced by ICU Nursing professionals in COVID-19 times. ³⁴	Fear of the unknown in relation to COVID-19. Fear was intensified by the lack of structure and adequate materials, mainly PPE. Lack of constant theoretical and practical training on COVID-19.
To analyze nurses' conception of professional satisfaction in the ICU environment. ³⁵	Autonomy is important in the work process and to attain good quality assistance. The technological support used contributed for nurses to provide safe assistance to critically-ill patients. They feel satisfied with the care they offer to their patients.
To determine ICU nurses' occupational stress level during COVID-19 and to identify the stressful factors. ³⁶	The main reasons for occupational stress were inadequate wages, tiredness, lack of PPE, deterioration in the patients' clinical condition, more than 40 weekly working hours, negative environmental conditions and excessive number of patients per nurse.
To explore ICU nurses' willingness to provide care during the COVID-19 pandemic. ³⁷	ICU nurses' predisposition is associated with the managers' adequate communication. Importance of staff management relationships. It is imperative to have all the necessary information to provide high Nursing care standards in a timely and precise way.
To explore the challenges experienced by ICU nurses while providing care to COVID-19 patients. ³⁸	Insufficient institutional support, lack of appreciation for the team and no financial support from the hospital indicated deficient organizational support. Medical leaves, Nursing workforce shortage and intense shifts indicated work overload. PPE shortage and discrimination in its provision were identified as two of the main challenges faced by ICU nurses.
To describe the experiences of ICU nurses who provided care to COVID-19 patients and their perceptions about the disease and the working conditions during the pandemic. ³⁹	COVID-19 was mainly associated with death and the fear of dying. It is an unpredictable disease associated with loneliness and restrictions to freedom. Lack of standards in the Nursing assistance provided to COVID-19 patients. Empowerment or dissatisfaction exerted an influence on nurses' perception about their profession.
To describe the experiences of Canadian ICU nurses in the care of COVID-19 patients during the second wave of the epidemic. ⁴⁰	3 central issues emerged: frequent changes in policies and guidelines; lack of resources; and staff shortage. The policies and guidelines changed frequently, sometimes on the same day. These rapid procedural changes rendered nurses anxious and vulnerable. The knowledge about the treatment modalities would reflect on the care provided to critically-ill patients.
To study Person-Centred Care, based on the ICU nurses' experiences during the first COVID-19 wave. ⁴¹	The nurses felt unprepared and with no time to reflect on the care provided. Fear of contracting the infection or infecting other people. Intensive care nurses and from other specialties worked together, welcoming the opportunity to work with peers they had never met.
To understand ICU nurses' experiences with patients infected by	Need to adapt the ICU environments for the care of COVID-19 patients. In relation to mental health, fear of

COVID-19. ⁴	contamination in the work environment stood out.
To analyze the effect of motivational messages on feelings of optimism, hopelessness and life satisfaction of ICU nurses during the COVID-19 pandemic. ⁴²	The motivational messages increased the optimism and satisfaction with life levels, at the same time that they reduced the hopelessness levels. The motivational techniques were important for nurses' mental health. The professional and social support systems are significant to improve ICU nurses' motivation and mental health.
TOPIC 3	The Nursing care revolution in COVID-19 times
To identify the effect of online communication between a nurse and the family member of a COVID-19 patient on the stress level. ⁴³	The stress level perceived in family members of COVID-19 patients before the intervention was from moderate to severe in both groups. The results showed that, after the intervention, the mean scores of the Intervention Group decreased and there was a statistically significant difference with the Control Group, which indicates the effectiveness of the intervention in improving family stress.
To explore intensivists' nurses' experiences in caring for COVID-19 patients. ⁴⁴	Nurses act as patient safety promoters in the ICU, they show respect for the patients' values, and are the link and communication between the patients and the ICU health team.
To determine the effect of the guided imagery exercises on death anxiety among ICU nurses. ⁴⁵	Guided imagery is effective in reducing ICU nurses' death anxiety and can be used as a complementary treatment method to promote mental health and the quality level of the services provided. These techniques can produce effective results in the entire health team.
To understand the impact of music in the COVID-19 ICU as a care humanization instrument, from the nurses' perspective. ⁴⁶	Music Therapy promotes humanization, improves the environment and allows for emotional improvements in health professionals, which exerts an influence of care quality.
To relate Nursing diagnoses and interventions for severely-ill patients affected by COVID-19 and sepsis in the ICU, according to ICNP®. ⁴⁷	It constitutes a guide for the professional practice that, based on inherent critical-reflective thoughts, leads its agents to effective and patient-centered decision-making; it eases monitoring the quality of the care provided for scientific advancement and for the development of the theory that supports it.
To explore ICU nurses' narratives on patient safety management during the COVID-19 pandemic. ⁴⁸	Maintaining patient safety through the clinical practice in the ICU during the outbreak was characterized by personal stories of Nursing practices that were different from the usual ones.
To explore ICU nurses' experiences with the process to implement and apply the Post-ICU Diary. ⁴⁹	The following topics emerged: implementation process, COVID-19, integration and motivation. The results showed that nurses perceived the Post-ICU Diary as applicable in everyday care and endorsed the added value of the Post-ICU Digital Diary as a new opportunity to improve inter-human connectivity.
To explore the experience of Cardiology nurses working in a COVID-19 ICU during the pandemic. ⁵⁰	The duties and responsibilities of the Cardiology nurses from a COVID-19 ICU included physical and psychological care practices. Although the nurses experienced some difficulties, they made an important contribution to the management of Nursing services with their experience and skills.

Nurses' physical and emotional health in the Intensive Care Unit

In this topic, 18 studies were integrated, six of which dealt with the experience of nurses working in an ICU during the COVID-19 pandemic.^{13,16,20,22,25-26} The care of critically-ill patients requires nurses who are mentally, emotionally and psychologically prepared for any situation. Due to the creation of specific ICUs for COVID-19, many nurses took over these units without previous experience, which caused deep feelings of insecurity with the new job, new functions, patients and different equipment than usual.^{13,15-16,18,20}

The high degree of stress at work manifested itself in psychological and physical signs and symptoms, characterized by moderate to severe insomnia,^{14,17-18,23} associated with headache,²⁰ intense sweating,²² dyspnea and fatigue.³⁰ The psychological factors generating intense moral distress were reported in 14 of the studies, including diagnoses such as Post-Traumatic Stress due to the contingency involved in the COVID-19 pandemic, depression, stress, anxiety, insomnia and anguish.^{14-18,20-25,27-28,30} Fear was a present feeling, especially due to lack of knowledge about the disease, absence of an effective treatment and the possibility of imminent death for all people. However, the professionals with more experience in ICU presented better impacts related to moral distress and quality of life,¹⁵ as well as higher resilience levels.^{17-18,20}

Additionally, the complexity of the experience and relationships with new colleagues was related to improved Nursing practice.²⁹ Once the reinforcement of psychological support and regular training was identified, it was noticed that nurses with greater social and emotional support had a reduction in anxiety and depression,²⁴ and that other factors such as carrying out activities together with their families²⁶ and taking self-protection measures¹⁹ also exerted a positive impact on nurses in the face of stressful situations.

Nurses' occupational health in the COVID-19 Intensive Care Units

Of the 13 studies that addressed the occupational health of nurses in COVID ICUs, six dealt with the experience of caring for patients infected with COVID-19, and the way in which the environment influences workers' health.^{4,31-33,38-39} Appreciation of teamwork and organization of the work process in the actions of experienced professionals were positively evidenced. In the negative positions, the challenges and adversities in dealing with the unknown and severity were listed, favoring the hiring of inexperienced professionals to work in an ICU, adding stress to everyday life.

This is mainly due to the reallocation of nurses specialized in critical care to work in ICUs other than their own. It is also due to the work overload resulting from the increase in the daily workload due to staff deficit, in addition to the of equipment and everyday supplies and the need to use PPE for longer than desired and lack of control in the use of these PPE items. The increase in the number of beds is also portrayed, leading to professional exhaustion and increased occupational stress due to the sudden change in the ICU routine.^{4,32-36,38,40-41} Job satisfaction appears through autonomy, dignified remuneration, regular training opportunities and organizational support,^{35,37} and one of the studies points to daily motivational messages as drivers to increase optimism and job satisfaction.⁴²

One of the aspects raised in 13 studies that had a negative effect on nurses' physical and emotional health was the scarcity and discomfort of prolonged PPE use in the ICU, affecting the quality of the work performed.^{18,20,25-27,30,32,34,36-37,39-40,50}

Communication with the patients was indicated in six articles as being affected as a result of PPE, due to the reduction in the team's time with the patients, as the care

measures were grouped to minimize exposure to the virus, and also due to the time spent on gowning, emphasizing the difficulty seeing the patients and performing care measures, due to the use of protective glasses.^{4,16,32,38,41,50} PPE acquisition by the nurses themselves due to their deficit in the institutions,³⁸ training for proper PPE use,^{34,44,47} and the differences between PPE quality and quantities made available to physicians and nurses were also reported as generating demotivation and a feeling of devaluation.³⁸

The Nursing care revolution in COVID-19 times

This theme includes eight studies about care strategies and technologies implemented from the COVID-19 pandemic. Two of the technologies mentioned were applied with family members of hospitalized patients. The first one was communication between the Nursing team and the relatives of patients admitted to the ICU via the Internet, cell phones and iPads, which contributed to reducing family stress, anxiety and depression.⁴³ The second one consisted in the creation of the Post-ICU Diary, which was offered to the family members after the patients were admitted, considering the total restrictions on visits and, with that, certain comfort was provided to the families, in addition to allowing communication with the team.⁴⁹ Relaxation techniques through mental images were essential to release situations that generate stress and promote nurses' mental health, providing opportunities for improving the quality of the services provided.⁴⁵

The use of support technology for the multidisciplinary team and for patients admitted to the ICU, such as music therapy, with the objective of minimizing the feelings of distress, stress and loss experienced was also reported.⁴⁶ The expertise in intensive care and the Systematization of Nursing Care through the Nursing Process were identified as a positive aspect patient care qualification, as they constitute a guide for the professional practice related to the COVID-19 pandemic.^{47,50}

A number of articles also discussed nurses' role as advocates for patients, ensuring safety, respect for their values and comfort in the final moments of life for the people under their care.^{44,48} Aligned with quality care, Canadian nurses question the care practices carried out during the second COVID-19 wave, regarding complex and painful treatments, with questionable benefits.⁴⁰

Discussion

This integrative literature review pointed out the scientific evidence in terms of care, occupational, physical and emotional health of nurses during the COVID-19 pandemic through 39 studies. There is growing concern to evidence the COVID-19 consequences on nurses' health, especially the search for alternatives to minimize physical and psychological distress.

The descriptions in the literature showed that work overload, patient deterioration, confinement, continuous PPE use and fear of contamination resulted in manifestations of mental distress, depression, stress, anxiety, insomnia and anguish. It is noted that the impacts on nurses' physical and emotional health were centered on occupational difficulties related to the environment, materials and supplies, due to the absence of PPE and/or to the intense activity and uninterrupted PPE use that would guarantee the health of these professionals.

In the literature integration, isolation evidences a stigma associated with COVID-19 due to the fear of contamination, and portrays certain escape from a comforting emotional

connection to patients and families, due to the everyday distress of witnessing countless farewells in the face of daily deaths. Several feelings of emotional conflicts in these nurses and other health professionals are also pointed out in view of what they experience on a daily basis and the social imaginary of the representation of “heroes” of the pandemic.²⁰

Even in an ICU, COVID-19 patients require differentiated care due to the specific characteristics of the disease and the rapid instability of the general condition, imposing even greater complexity on Nursing care. Ethical stress permeates this reality when nurses find it difficult to provide adequate care, negatively affecting their physical and mental well-being, causing anxiety, depression, emotional exhaustion, irritability, nervous breakdowns, fear, helplessness, concern, decreased appetite, fatigue, insomnia, frequent crying and suicidal thoughts.^{20, 52-56}

The relationship between time of professional experience and stress manifestations in the care of COVID-19 patients in the ICU revealed that professional experience is inversely proportional to the level of stress and/or psychological crisis in Nursing professionals.^{54,56-58} Integration of the studies evidenced physical and emotional aspects related to workers' occupational health. Uninterrupted mask use caused headache, dizziness, dyspnea, communication difficulties, fatigue and stress.⁴⁵⁷ This evidence is corroborated in a study that identified the challenges faced by ICU nurses in the care of COVID-19 patients at a hospital in Iran, in which low organizational support, physical exhaustion, uncertainty and psychological burden were observed.³⁸

Physical and mental exhaustion led to a psychological adjustment in coping with the work routine, including the mutual support capability.⁵⁹ Lifestyle changes, hard work, erratic sleeping and eating patterns, and increased alcohol and tobacco consumption exacerbated professional exhaustion.⁹ Additionally, it was evidenced that some measures can minimize deterioration of stress symptoms that not only depend on individual actions but on institutional and organizational support in health. Among the measures are to include a psychologist in the team, encouraging nurses to familiarize themselves with the work environment and procedures, and assigning patients according to nurses' skills.

In addition to that, it is necessary to emphasize the increase in training opportunities for job qualification and specific professional competence for assistance in COVID-19. This review includes protective, hygiene and sanitary ethics measures, necessary breaks between shifts and open, sensitive and truthful communication both through the traditional use of relationships and dialogicity and through the media. Furthermore, among other integrative and complementary practices, resorting to complementary therapies such as reiki, auriculotherapy, aromatherapy, music therapy and comfortable environments was also suggested.^{20,60}

It is important to recognize the anxiety sources to enable leaders and organizations to develop support strategies for health professionals, such as measures to help manage stress and anxiety, through a matrix of suggestions and feedback, as well as promoting support for the emotional and psychological needs of health teams via webinars.

In the studies analyzed, the nurses' role in defending the rights of COVID-19 patients was identified. Historically, these professionals have always acted as protectors of social justice. In COVID-19 times, they were pioneers in identifying and formally addressing threats to the safety of patients and nurses themselves, in addition to going out to the streets to protest against the lack of essential equipment and safety at work.⁶¹ Nurses are not intimidated by the need to intercede for the patients' rights, even if they are contrary to their employers' interests. Nurses' participation in changing health policies was presented

during the pandemic caused by SARS-CoV-2 when they assessed the impact exerted by lack of PPE and other equipment on the quality of the care provided to the patients.³⁸

The limitations of this study focus on only discussing nurses' performance and role in a COVID-19 ICU, and not on the multiprofessional team; in addition to the articles related to language and the data collection period that may have omitted potentially relevant results to the theme.

In terms of contributions, it is understood that this study portrays the chaotic scenario of the COVID-19 pandemic and, with this, points out the needs for integration, sharing and development of research studies that expand the advocacy not only of nurses but, mainly, of human health and care, so that, in the face of other tragedies or pandemics, health institutions and professionals from all areas acquire the necessary expertise to face them.

Conclusion

Nurses who worked on the front lines in ICUs during the pandemic were exposed to long working hours, lack of material and human resources and inadequate working conditions, which affected their physical and emotional health. This review points out that, despite all the challenges experienced by ICU nurses during the pandemic, updating and seeking professional competence remained driven by the promotion of better patient care. Despite the difficulties, nurses were able to implement new care technologies that benefited both patients and their family members.

They perpetuated themselves as advocates of the patients' rights, even when their rights were not being properly attended to. Despite the unprecedented nature of this pandemic, others of a similar nature may strike in the future. Therefore, the difficulties faced can and should be used as a source of knowledge and experience for health organizations to adapt and prepare in case of new outbreaks, endemics, epidemics or pandemics. In synthesis, the professional roles still need to be discussed for the effective validation of equitable and interprofessionally shared health practices.

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