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The Effect of COVID-19-Related Stress on Registered Nurses in The United States

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THE EFFECT OF COVID-19-RELATED STRESS ON REGISTERED NURSES IN THE UNITED STATES

by

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Abstract

The United States, as of October 2021, is the country with the most reported COVID-19 cases and COVID-19 deaths in the world. Since the first case was confirmed, Registered Nurses working in the acute care setting have been at the forefront of this public health crisis. As the pandemic has continued, studies have been conducted to collect, analyze, and reveal the effect of COVID-19-related stress on Registered Nurses in the United States. This critical literature review takes eleven published studies related to this topic, discusses the commonalities between them, addresses limitations in the literature and offers recommendations for future research. This review discusses five themes among the studies: the impact of inadequate PPE supply, COVID-19-related stress from direct contact with COVID-19 patients, stress levels reported by those working in the ICU setting, nurses self-isolating and the fear of infection or infecting others with COVID-19, and continued exposure to stressful work conditions during the pandemic, resulting in long-term effects, including chronic stress and post-traumatic stress disorder (PTSD). The databases used for this project were CINAHL Plus with Full Text, APA PsychInfo, and MEDLINE. This literature review suggests that COVID-19-related stress in the nursing profession in the United States produced acute and chronic stress responses. Nurses experienced various negative emotions, including burnout, stress, anxiety, and depression. Additional findings included insomnia, fatigue, and feelings of not being supported adequately by hospital administration. Based on the results, the researcher identified several recommendations to aid future research exploring the topic of COVID-19-related stress among registered nurses in the

United States and how this research can be utilized when considering ways to address work-related stress and PSTD among acute care nurses in the future.

Dedication

The literature review was conducted while I worked full-time at the bedside in the acute care setting during the pandemic, including in a COVID-19 Intermediate Critical Care Unit. I have witnessed burnout, anxiety, depression, and fatigue in myself and my colleagues. This literature review is dedicated to Registered Nurses working the frontline during the pandemic and those who lost their lives in the process.

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Introduction

COVID-19 is disease caused by the SARS-CoV-2 virus, which was discovered in January 2020 in China and quickly spread across the world, evolving into a global pandemic and a series of national public health crises (Zheng, 2020). The SARS-CoV-2 virus can spread through direct contact with respiratory droplets in the air, originating from saliva or mucous of infectious persons (WHO, 2020). The disease primarily affects the respiratory system, with mild to moderate symptoms and no special treatment required in most cases (WHO, 2020). However, some people who are infected with the virus develop severe symptoms, including hypoxic respiratory failure, kidney failure or even death (Del Vecchio & Locatelli, 2020).

On January 21st, 2020, the U.S. declared its first COVID-19 positive person in Washington (AJMC, 2021). Nearly two weeks later, on February 3rd, 2020, The U.S. announced the COVID-19 outbreak a public health emergency, and on March 11th, 2020, the World Health Organization announced a global pandemic (AJMC, 2021). Lockdowns and curfews were implemented across the nation starting in spring of 2020, and a cascade of precautions ensued, with schools closing, businesses operating remotely or with reduced contact, masks were mandated, and a halt to mass transportation systems and travel, both domestic and international, was ordered (Katella, 2021). State Governors responded by implementing mandates, and not all reacted the same. For example, New York Governor Andrew Cuomo implemented a lockdown from March 2020 to April 2020, followed by a four-phase reopening plan by region lasting until July 2020 (Ballotpedia, 2020). In contrast, Texas Governor Greg Abbott enforced a statewide

lockdown with restrictions on gathering in groups and closures of public facilities from March 2020 to April 2020 and lifted all mandates after that (Rayasam, 2020).

While governments were responding to COVID-19 as a public safety threat, hospitals also responded according to their own needs. Initial concerns in early 2020 focused on obtaining adequate personal protective equipment (PPE) for staff, gathering COVID-19 testing supplies, improving wait times for test results, maintaining adequate staffing, supporting existing staff, and expanding hospital capacity to treat patients (U.S. Department of Health and Public Services, 2020).

For more than a year, registered nurses have been working at the forefront of the COVID-19 crisis, directly responding to increased hospitalizations and medical emergencies. In a psychosocial context, COVID-19 has caused increased levels of perceived stress and has affected multiple facets of life for nurses in the United States, with stress ranking as the top emotion regularly reported by healthcare professionals during the pandemic (Mental Health America, 2020).

Acute stress is defined as the body's response to a perceived threat, with stress response symptoms ranging from mild to severe, triggered during various situations including major life changes, the work environment, social environment, and exposure to traumatic events (Mayo Clinic, 2019). *Chronic stress* has been variously defined as a specific ongoing environmental condition or stressor with enduring impact, lasting from 4 months to 12 months (Hammen et al., 2009). The COVID-19 public health crisis resulted in alarmingly high hospitalization rates, generating both acute and chronic stress responses amongst acute care registered nurses (RNs) in the United States (Moore et al., 2020). By August 2021, the U.S. had experienced three waves of COVID-19 hospitalizations. The first wave was in April 2020, with 59,924 hospitalizations;

the second wave was in July 2020, with 59,712 hospitalizations (Barclay & Scott, 2020). The most recent and largest wave, in December 2020, saw 100,262 hospitalizations due to COVID-19 (Barclay & Scott, 2020).

To support the rapid increase of critically ill patients in the U.S., multiple nursing regulatory bodies (NRBs) declared exceptions for inactive or retired licenses, to enhance the number of nurses working during the public health crisis (NCSBN, 2020). Additional responses from NRBs included waived application fees for reinstating a license, expediting license processing times, temporary work permits for licensed nurses to travel and work in areas with critical staffing shortages, and extension of license expiration dates (NCSBN, 2020).

The COVID-19 pandemic not only involved nurses reinstating licenses and taking on new public health roles to contribute to the overall efforts in the workforce but also featured the reassignment of practicing nurses in the acute care setting to areas outside of their specialty, such as to the ICU and PICU, based on acutely changing population needs (Minissian et al., 2021). Experienced nurses throughout the healthcare system were reassigned to care for patients in COVID-19 units (Cedars Sinai, 2021) or to serve as nurse leaders when training medical-surgical nursing staff who anticipated redeployment into new critical care-based roles (Minissian et al., 2021). These adjustments to workforce deployment were necessary, and the interventions to care for patients were predominately carried out by nurses, which also contributed to increased levels of perceived stress (Gordon et al., 2021).

A survey on the mental health of healthcare workers in COVID-19 from June to September 2020 reported 22% of all participants to be nurses, ranking the profession as the second largest group involved after physicians, who ranked first (Mental Health America, 2020). Among the surveyed nurses, 41% confirmed that they worked in direct contact with COVID-19

patients, 45% reported not having adequate emotional support during the pandemic, and 67% were more likely to feel mentally and physically exhausted after work in comparison to other healthcare professions (Mental Health America, 2020). Other emotions experienced by nurses working in the acute care setting included feeling "stretched out too thin," worrying about exposing loved ones to COVID-19, emotional and physical exhaustion, and struggling with parenting (Mental Health America, 2020). Another survey interviewed 695 nurses to collect information on the most stressful situations experienced by those working the bedside in the earlier stages of the COVID-19 pandemic (Arntez et al., 2020). The results of these surveys identified major workplace stressors as the following: exposure to illness; infection of self; illness or death of others; inadequate PPE or supplies; unknowns; and opinions or politics based around the COVID-19 virus (Arntez et al., 2020).

An acute stress response, when unresolved, can become chronic stress, with long-term side effects (Mayo Clinic, 2019). A survey involving 231 nurses revealed that nearly one out of six are at risk of resigning from the nursing profession entirely, and nearly three out of seven are at risk of leaving their employer within the next two years, with these numbers highly attributable to the rising levels of perceived stress during the COVID-19 pandemic (Moore et al., 2021). These findings suggest that the ongoing crisis may exacerbate the shortage of healthcare workers (HCWs) and increase turnover in the nursing profession, creating long-term effects from repeated exposure to unsafe and unstable conditions during the COVID-19 pandemic (Moore et al., 2021).

Overall, the rapidly evolving changes to the clinical setting during the pandemic, in conjunction with personal changes felt while coping with societal modifications outside the workplace, created an unstable and uncertain environment for nursing professionals, contributing

to perceived levels of acute stress, in some circumstances leading to chronic stress (Gordon et al., 2021).

Purpose

The purpose of this critical literature review is to explore current knowledge on the effect of COVID-19-related stress on Registered Nurses practicing in acute care environments within the United States. The review will identify content themes in the scholarly literature, discuss the commonalities between the studies, address limitations in the literature and offer recommendations for future research.

Method

The databases used for this project were CINAHL Plus with Full Text, APA PsychInfo, and MEDLINE. Search terms included were (MH "COVID-19") OR (MH "COVID-19 Pandemic") or covid-19 or coronavirus or sars-cov-2 or cov-19 or 2019-ncov) AND nurse* AND (stress* or burnout or "emotional exhaustion" or "psychological wellbeing") AND (MH "United States+") OR (MH "United States by Individual State+") OR (MH "United States by Region+"), and all 50 states listed individually.

Search expanders included applying all equivalent subjects. Search limiters included selecting articles published in academic journals, articles published in English, and studies conducted within the United States. Excluded were articles that did not explore the incidence or experience of perceived COVID-19-related stress among bedside RNs and articles that did not involve RNs practicing in the acute care setting.

Research conducted outside of the U.S. was excluded from this review because the U.S., as of 2021, has had the most COVID-19 among all countries in the world (CSSE, 2021), had the highest excess mortality rates in 2020, and has reported that people under the age of 75 were more likely to have died due to the pandemic in the U.S. than did in other countries (Amin & Cox, 2021). COVID-19 has left a profound effect on nursing professionals within the U.S. overall, and this critical review focused on the COVID-19-related stress for RNs working in extreme conditions in the U.S., which may vary from the experiences of nurses in other countries with different healthcare systems, disease prevalence, and responses to the pandemic. The reason for excluding research on nursing professionals other than bedside RNs practicing in the acute

care setting is because COVID-19 has been primarily managed in acute care hospitals with designated COVID units in hospitals and emergency guidelines in place for COIVD-19 outbreaks, monitored and mandated by these acute care facilities. (CDC, 2020a). Meanwhile, numerous clinics, physician offices, and other outpatient facilities transitioned to telehealth operations during the pandemic (CDC, 2020b), resulting in a decreased level of COVID-19 patient exposure and different work environments for the nursing professionals in those areas, in comparison to those working in the acute care setting.

The search yielded 160 articles. 134 articles remained after duplicates were removed. From there, 92 articles were excluded through a title and abstract review, based on whether the abstract included the following themes: experiences of registered nurses practicing within the acute care setting in the United States, COVID-19-related stress, and outcomes of COVID-19-related stress such as burnout, anxiety, depression, or fatigue. Articles that mainly discussed methods to improve or reduce existing stress were not considered as that is not the focus of this review, as were articles that did not involve statistics or survey results from Registered Nurses (e.g., the article used "healthcare workers" or "healthcare professionals" to classify all participants, instead of separating roles and reporting data on the Registered Nurse experience specifically). After this narrowing process, the remaining 42 articles were read in full, and 31 were further excluded based on the previously mentioned exclusion criteria. The 11 articles used in this critical literature review and the results are classified by theme, based on similarities in data or outcome.

A flow chart was created to demonstrate the selection process, depict narrowing based on search criteria, and list the rationales for article rejection. To identify gaps in the literature, there

will be a discussion about areas not explored or under-explored in the research, limitations, and recommendations for future research.

Summary of Literature

Eleven studies met inclusion criteria for the literature review, including six cross-sectional quantitative studies (Ali et al., 2020; Arnetz et al., 2020; Firew et al., 2020; Garcia et al., 2021; Hernandez et al., 2021; Sagherian et al., 2020), one qualitative descriptive design study (Gordon et al., 2021), one collaborative research qualitative study (Cadge et al., 2021) one cross-sectional mixed-method study (Gray et al., 2021), one phenomenological qualitative study (Iheduru-Anderson, 2021), and one multiple regression quantitative study (Sharma et al., 2021).

The population for ten out of the eleven studies featured Registered Nurses only, while the remaining study involved Registered Nurses and other healthcare workers, with data published in separate categories according to the profession. One study focused on Registered Nurses working in the acute-care setting caring for COVID-19 patients directly. The other ten focused on Registered Nurses working in the acute-care environment during the COVID-19 pandemic but not having had constant contact with COVID-19 patients.

The literature review analyzed COVID-19-related stress among Registered Nurses in the United States, which has been reported to be felt regardless of coming into direct contact with COVID-19 positive patients (Ali et al., 2020; Arnetz et al., 2020; Firew et al., 2020; Garcia et al., 2021; Gray et al., 2021; Hernandez et al., 2021; Iheduru-Anderson, 2020; Sagherian et al., 2020; Sharma et al., 2021). The COVID-19 pandemic has taken a toll on the work conditions of acute-care facilities in the United States, and Registered Nurses on the front lines have been at inherent risk of traumatic stress working in understaffed, poorly equipped, high acuity environments (Hernandez et al., 2021). The literature's five common themes were the stress-impact of

inadequate PPE supply, COVID-19 related-stress from direct contact with COVID-19 patients, stress levels reported by those working in the ICU setting specifically, isolation and the fear of becoming infected or infecting others with COVID-19, and continued exposure to stressful work conditions resulting in long-term effects including chronic stress.

PPE As a Cause of COVID-19-Related Stress

Literature from four of the eleven articles (Arnetz et al., 2021; Gordon et al., 202; Hernandez et al., 2021; Iheduru-Anderson, 2021) focused on the nation-wide PPE shortage during the COVID-19 pandemic and the effect of PPE shortages on perceived COVID-19-related stress levels among RNs in the acute care setting.

Personal Protective Equipment (PPE) is worn to create a barrier between people and infectious organisms and reduces the chance of touching, being exposed to, and spreading communicable diseases (Medline Plus, 2019). When caring for COVID-19 positive patients or suspected positive patients, the preferred PPE is face shields or goggles, an N95 or higher respirator, clean non-sterile gloves, and an isolation gown (CDC., 2020c).

PPE is utilized daily in the acute care setting and the demand for PPE has increased with the COVID-19 pandemic. RNs in the acute care setting provide direct patient care as part of their assignment and as such, consistently require PPE to perform tasks safely at work. During the COVID-19 pandemic, PPE has been reused (CDC, 2020d), rules about utilizing PPE have been changed in relation to production disparities, and PPE has been intermittently available (Gordon et al., 2021).

PPE availability in the acute care setting emerged as a primary issue during the COVID-19 pandemic, as the lack of adequate PPE placed nurses and other healthcare workers at greater

risk for contracting the virus, becoming acutely ill, and possibly dying (Iheduru-Anderson, 2021). Registered Nurses comprise the largest component of the healthcare workforce and they are the primary providers of hospital patient care (AACN, 2019). Not having the necessary types or amount of PPE to interact safely in the workplace has generated stress among nursing professionals (Arnetz et al., 2020).

The common theme among the four articles is how inadequate PPE supply at work has had a negative impact on RNs, eliciting emotions such as stress, fear, anxiety, anger, and trauma (Arnetz et al., 2021; Gordon et al., 2021; Hernandez et al., 2021; Iheduru-Anderson, 2021). In a study conducted with 695 nurses working in an inpatient setting, 59.1% of participants who lacked adequate PPE at work were likely to report symptoms of anxiety, depression, or post-traumatic stress disorder (Arnetz et al., 2020). Additionally, RNs reported physical symptoms from having to work long hours in layers of PPE, such as feelings of discomfort, headaches, and exhaustion (Gordon et al., 2021).

Another study captured the emotional and mental health side effects of not having proper PPE (Iheduru-Anderson, 2021). In interviews conducted with 28 acute care nurses, common negative emotions associated with inadequate PPE at work included feeling scared and afraid, a sense of isolation, anger, betrayal, exhaustion, being overwhelmed, grief, helplessness, and loss (Iheduru-Anderson, 2021). Nurses described the despair and overwhelming feelings from the lack of proper PPE during the interviews (Iheduru-Anderson, 2021). One nurse stated:

> It went against everything we swore not to do. Sometimes I wondered how many people were infected because of us not having appropriate PPE. Was this my contribution to the crisis? It was difficult not having control over my practice at

> this time. I felt like my hands were tied behind my back. (Iheduru-Anderson, 2021, p. 9)

and another nurse stated:

> I was angry, afraid, disappointed, at once. Who is going to care for me, my family if I get sick? How can they ask me to make my own mask? Use a scarf to protect myself? Why is the standard of care in the richest country in the world so low that as a nurse I have to make my own PPE? I am still angry. Bad leadership placed me and my loved ones at risk. I did not become a nurse to be sacrificed. (Iheduru-Anderson, 2021, p. 7)

These nurses were overwhelmed, exhausted, and full of grief, with a lack of PPE contributing to these negative feelings (Iheduru-Anderson, 2021).

A cross-sectional quantitative study focused on post-traumatic stress disorder (PSTD) in Nurses working in the acute-care setting during the pandemic showed elevated Trauma Screening Questionnaire scores with inadequate PPE supply as a contributing variable (Hernandez et al., 2021). 87% of nurses claimed they have reused disposable masks or N95 respirators, and 27% reported previous exposure to COVID-19 patients without having worn the appropriate PPE, and both events contributed to perceived stress in the workplace (Hernandez et al., 2021). In another study involving 110 nurses during the pandemic, lack of PPE at work was reported to be a significant stressor, prompting them to ask, “how much worse can this get?” (Gray et al., 2021). Unclear guidelines and constantly changing protocols related to PPE use or availability were identified as major stressors for nurses (Gordon et al., 2021). In contrast, RNs who reported having adequate PPE at work considered this motivation to continue participating in clinical care and classified having adequate PPE as a contributing factor in creating a safe and

supportive work environment (Gray et al., 2021). Additionally, implementing strategies to ensure PPE is consistently available to staff as needed, combined with educating staff on donning and doffing processes, can help mitigate potential fear felt in future pandemics or public health crises where PPE is required (Gordon et al., 2021).

COVID-19-Related Stress When Directly Caring for COVID-19 Positive Patients

Literature from three of the eleven articles (Cadge et al., 2021; Firew et al., 2020; Gordon et al., 2021) focused on COVID-19-related stress when caring for COVID-19 patients directly. Participants in the three studies primarily worked in the ED and ICU settings. Two articles present qualitative data (Cadge et al., 2021; Gordon et al., 2021), while the other is a cross-sectional quantitative study (Firew et al., 2020).

A study which examined frontline healthcare providers in direct contact with COVID-19 patients, including RNs, showed that those who provided care to a greater number of COVID-19 patients were associated with increased likelihood of infection with COVID-19 (Firew et al., 2020). The increased likelihood of infection was found particularly in those who cared for more than 100 COVID-19 positive patients or had close contact with infectious patients for more than 50% of total hours spent at work (Firew et al., 2020). Those who worked more than 50% of the time in close contact with COVID-19 patients were also revealed to have higher levels of depression, anxiety, and burnout, in relation to persons who worked less than 25% of the time in close contact with COVID-19 patients (Firew et al. 2020). In addition, those with colleagues from the same department who were hospitalized because of COVID-19 were seen to have higher levels of depressive symptoms and burnout (Firew et al., 2020).

In a qualitative study which interviewed 16 ICU nurses who provided direct care for COVID-19 patients, four themes emerged concerning their experiences during the first COVID-19 surge (Cadge et al., 2021). Concerns felt by these nurses were related to the challenge of working with new colleagues, maintaining existing working relationships, the importance of nursing leadership when providing information and maintaining group morale and the importance of institutional level acknowledgment of work which nurses completed during the pandemic (Cadge et al., 2021). These four themes were then broken down into subthemes related to the nurse experience, including nurses struggling with defined roles, disruption of staff relationships with deployment, deployed nurses serving under new leadership and requiring additional support, and improper and insufficient acknowledgment from hospital administrators. One nurse stated:

> I think that there should have been more check ins with the nursing staff that got floated…you took them from their comfort home…and you dumped them in a unit that you had no clue about. (Cadge et al., 2021, p. 1969)

Another nurse stated:

> …there was just zero, zero acknowledgment for what we did. And still, there has been none…We got nothing…It is challenging to work for an organization…and to not be able to be given the recognition we as a staff deserves. (Cadge et al., 2021, p. 1970)

Nurses reported that they participated in the study because they felt invisible and wanted to be heard, which correlates with reports of feeling unseen and unheard by hospital administration, coupled with feeling isolated from the public and making intra-institutional support even more important to them (Cadge et al., 2021).

Another study interviewing 11 ICU nurses who provided care for patients with COVID-19 reported that nurses who participated were fearful and felt powerless against COVID-19 (Gordon et al., 2021). Nurses were classified as "heroes" in the mainstream media for their work but reported that they received stigmatizing attitudes by those viewing them as virus carriers since they had contact with known positive patients (Gordon et al., 2021).

These three studies revealed that direct contact with COVID-19 patients, including coworkers who became positive for COVID-19 and were then admitted as patients, negatively affected RNs in the acute care setting, provoking depression, anxiety, and burnout. The comprehensive data from one study noted that RNs and EMTs are the professions at highest risk for contracting COVID-19 while at work because of the amount of direct contact they have with patients (Firew et al., 2020). For those nurses who worked with COVID-19 patients, the need for institutional support and public understanding was crucial. Without it, negative emotions of isolation and feeling unseen and misunderstood became prevalent among RNs at the bedside (Cadge et al., 2021).

The ICU RN Experience and COVID-19-Related Stress

Literature from three of the eleven articles (Cadge et al., 2021; Firew et al., 2020; Gordon et al., 2021) focused on the ICU RN experience and COVID-19-related stress. Two of the articles present qualitative data (Cadge et al., 2021; Gordon et al., 2021) and the other is a cross-sectional quantitative study (Firew et al., 2021). The three articles sampled RNs working during the pandemic in the acute care setting, with a focus on responses from ICU RNs.

Intensive Care Units (ICUs) became overwhelmed quickly during the pandemic as the number of patients requiring intensive care interventions increased, and hospitals were pressured

to expand the number of available ICU beds (Cadge et al., 2021). This department is equipped for emergencies and critical care interventions and inevitably served as the primary care area for COVID-19 hospitalizations. Mechanical ventilators and CPAP/BiPAP machines were in great demand, as these machines provide respiratory support to those with hypoxia or respiratory failure from COVID-19. These machines are managed only on units that have staff trained to manage them, such as the ICU. With the pandemic, the number of critical care patients and patients requiring breathing support rose, as did visits to the emergency department for COVID-19 symptoms. With this surge in hospitalizations, patient-to-nurse ratios became higher than what was previously acceptable, as did the amount of attention required to care for these patients. This led to subsequent stress, burnout, and anxiety among the nurses in these severely overwhelmed departments (Gordon et al.; 2021).

A study that interviewed 11 ICU nurses in central Texas discussed the psychological and physical symptoms associated with caring for COVID-19 patients who were acutely ill, including those who did not survive or were on end-of-life care (Gordon et al., 2021). These nurses reported feelings of anxiety/stress, fear, helplessness, worry, and empathy in response to the traumatic events occurring in the workplace (Gordon et al., 2021). Physical symptoms reported by all participants in the study were sleep disturbances, headaches, discomfort, exhaustion, and breathlessness (Gordon et al., 2021). One nurse stated, “COVID caused so many other problems like they couldn’t recover from that, so they [the patients] ended up dying anyways…” and another nurse reported “I definitely don’t sleep that well anymore. And even when I do sleep, it’s just anxious sleep.” (Gordon et al., 2021). Another study that interviewed 16 ICU nurses in a large hospital in Boston reported similar themes of helplessness, stress, and isolation felt amongst staff (Cadge et al., 2021). This study highlighted the negative emotions

experienced by nurses caring directly for COVID-19 patients and the importance that clear communication, consistency in policy and teamwork had in alleviating negative symptoms, especially those related to feelings of isolation and abandonment (Cadge et al., 2021).

Isolation and The Fear of Infection or Infecting Others with COVID-19

Literature from four of the eleven selected articles (Ali et al., 2020; Firew et al., 2020; Garcia et al., 2021; Sharma et al., 2021) focused on the commonly reported fear of becoming infected with COVID-19 or infecting family and friends with COVID-19, due to COVID-19 exposure by nurses in the acute care setting.

In a cross-sectional questionnaire study that surveyed 109 nurses working in hospitals that treated COVID-19 patients, 74% of the nursing staff were worried about getting infected with COVID-19, 70% were concerned about colleagues getting infected, and 82% were concerned about infecting friends or family (Ali et al., 2020). Similarly, 65% of the nurses in the study reported feeling concerned about being avoided by their friends and family members after known exposure to COVID-19 patients (Ali et al., 2020). This reported fear is seen in other studies as well (Firew et al., 2020; Garcia et al., 2021; Sharma et al., 2021), as healthcare workers who have been in contact with COVID-19 patients endured the burden of being viewed as potential COVID-19 carriers and experienced avoidance from those around them (Ali et al., 2021).

The term “healthcare heroes” was coined at the beginning of the pandemic to acknowledge the efforts made by these professionals at the bedside; however, it has been shown that the community can simultaneously distance themselves from those treating COVID-19 patients out of fear that they are high risk of spreading COVID-19 (Sharma et al., 2021). This

stigma can lead to feelings of isolation for nurses, or in some cases, cause them to engage in physical isolation from family and friends, to avoid the potential spread of the disease (Sharma et al., 2021).

The stigma of being viewed as a COVID-19 carrier, coupled with fears of infection at work affected nurses' personal lives and disrupted work-life balance by leading to changes in living conditions and altering daily interaction patterns with loved ones (Firew et al., 2020). Nurses held concerns over the inevitable risk that existed if they were to become infected with COVID-19 from work exposure and the subsequent risk of infecting family members, which was found to be significantly related to the general perceived stress among them (Garcia et al., 2021). A quantitative study involving 1,651 healthcare providers (HCPs) and 47% nurse participants focused on factors associated with mental well-being during the COVID-19 pandemic (Sharma et al., 2021) The most reported concern in this study was the transmission of COVID-19 to one's family or community (Sharma et al., 2021). Another study which surveyed 3,083 healthcare providers with 26.80% being nurses, showed that most providers reported taking precautions to protect individuals they lived with (Firew et al., 2020) The precautionary measures taken by these providers included self-isolation, moving residence temporarily, or sending cohabitants away from the home (Firew et al., 2020). Self-isolation and sending cohabitants away from home were associated with higher levels of burnout, particularly when compared with persons who did not take precautions in the home (Firew et al., 2020). Those who did not take precautions in the home also reported significantly fewer depressive symptoms, anxiety symptoms, and burnout when compared to those who took precautions (Firew et al. 2020).

Registered Nurses have reported the greatest concern about their health compared to other healthcare professionals, including doctors, doctors-in-training, advanced practice

providers, and respiratory therapists (Sharma et al., 2020). Overall, nurses have faced conflicting emotions of being praised for their work with COVID-19 patients and simultaneously being viewed as infectious carriers, fearing for their own safety and health and the safety and health of those around them.

The Long-term Effect of COVID-19-Related Stress on RNs

Three of the eleven articles (Ali et al., 2020; Garcia et al., 2021; Sagherian et al., 2020) focused on the long-term effect of COVID-19-related stress on nurses, including the development of chronic stress and post-traumatic stress disorder (PTSD).

Repeated exposure to acute stress or traumatic situations can develop into chronic stress or PTSD (Mental Health Foundation, 2020). Negative experiences felt by nurses in relation to sustained levels of work-life imbalance and repeated exposure to acute stress during the pandemic may have worsened the already-existing shortage of bedside nurses (Garcia et al., 2021). With fewer nurses at the bedside because of repeated exposure to stressful situations during the pandemic, this can create more stress for those that remain, as they then struggle to continue to show up to work without adequate staffing or clinical support on the floor, perpetuating the cycle of acute stress and the eventual development of chronic stress if the situation remains unchanged.

A cross-sectional study that surveyed 109 nurses working in hospitals that treated COVID-19 patients concluded that there was a lack of organizational support for those nurses at the bedside, including psychiatric assistance and none of the nurses in the study reportedly sought psychological therapy (Ali et al., 2020). The increasing stress levels associated with working at the bedside during the COVID-19 pandemic, and the lack of follow-up for psychiatric

symptoms, created an avenue for long-term side effects from repeated exposure to stress and the development of trauma from chronic stress.

A study on insomnia, fatigue, and psychosocial well-being during COVID-19 was conducted by surveying 384 registered nurses. The study concluded that nursing staff had experienced insomnia or irregular sleep, fatigue, and various psychological symptoms, such as burnout and PTSD, throughout the COVID-19 pandemic (Sagherian et al., 2020). RNs caring for COVID-19 patients directly were found to have a higher incidence of insomnia when compared with those who did not, and they had significantly greater feelings of depersonalization (Sagherian et al., 2020), which has been defined as a psychopathological syndrome involving the loss of personal identity and feelings of unfamiliarity about one's own behavior (Miriam-Webster, n.d.). In the study, nursing staff showed increased PSTD symptom severity and moderate psychological distress (Sagherian et al., 2020). With nurses at the bedside constantly being exposed to stressful or traumatic situations throughout the pandemic, including infection risk, fear, death, and isolation, this set a precedent for the development of chronic stress or PTSD among them.

Discussion

Overall, more research on the effect of COVID-19-related stress on the nursing profession in the U.S. is needed. Other countries, such as China and Italy, have published more data on their nursing professionals and the stress they encountered working during the pandemic and have started to publish research on this topic. One study from Italy published in May 2020, just three months after the W.H.O declared COVID-19 a global pandemic, focused on the experiences of 72 physicians and 73 nurses working the bedside during the public health crisis (Di Tella et al., 2020). The study resulted in similar conclusions to studies utilized in this literature review – that healthcare workers in COVID-19 units were at higher risk for developing symptoms of depression and post-traumatic stress syndrome and that women were also more likely to develop these symptoms (Di Tella et al., 2020). A study from China published in April 2020 analyzed work stress among nurses working during the pandemic in Wuhan in the Hubei province (Mo et al., 2020). The study results revealed how the unknown and uncontrollable nature of nursing work completed during the pandemic, and in addition to fear of separation from the home and loved ones, this created psychological pressure from working the bedside (Mo et al., 2020). In addition, anxiety was found to be a significant factor affecting these nurses' stress load and reports of anxiety and helplessness came from caring for so many patients (Mo et al., 2020). Results from the China study are similar to studies from the U.S., which also reported nurses' feeling fear, isolation, anxiety, and stress from being overwhelmed with patients and unknown scenarios (Ali et al., 2020; Firew et al., 2020).

Limitations

Each of the eleven studies acknowledged limitations, including lack of population variability, research done in only one facility, state, or region as opposed to a nationally, research conducted in urban hospitals only, and research conducted at specific points in the pandemic instead of over the long-term, as knowledge about the virus evolved and work conditions have continued to change for nurses in the acute care setting.

Five of the eleven studies lacked population variability (Cadge et al., 2021; Firew et al., 2020; Hernandez et al., 2021; Iheduru-Anderson, 2020; Sagherian et al. 2020). In these studies, participants were predominantly female and Caucasian. Male participants, people of color, and those who did not have a bachelor's or graduate degree had the lowest representation in these studies. It is essential to include these demographics when surveying the nurse profession, as the number of men and minorities who hold nursing licenses continues to grow. The number of male registered nurses increased from 7.1% to 9.6% of the total nursing population from 2016 to 2018 (U.S. Department of Health and Human Services et al., 2019). Additionally, Hispanics make up the largest minority in the profession, and for RNs who graduated in the past two decades, the proportion of minority groups appeared to be higher when compared to those licensed prior to that period (U.S. Department of Health and Human Services et al., 2019). When evaluating work-related stress and trauma from the pandemic, studies should reflect all participants to capture a more accurate image of the experiences those who make up the nursing profession may have.

Four of the eleven studies had research conducted at specific facilities, states, or regions only as opposed to a national scale (Firew et al., 2020; Garcia et al,, 2021; Gordon et al., 2021;

Sharma et al., 2021), and two had research focused mostly on large, urban hospitals (Ali et al., 2020; Sharma et al., 2021). With research exclusive to certain facilities, states, regions only, and not involving national results, this can skew the data collected as some areas experienced more of a crisis with the pandemic than others, an example being the Northeast U.S., which included "hot spot" states like New York and New Jersey. Studies focusing primarily on experiences from those in urban hospitals can also skew data, as urban hospitals, especially trauma centers, can have experiences that vary from those working in rural hospitals, especially when considering COVID-19 cases PPE, clinical resources, financial resources, and staffing.

Four of the eleven studies featured research conducted at a specific point in the pandemic, such as during the first wave or over the course of a few weeks and did not continue the research throughout the course of the pandemic (Garcia et al., 2021; Gray et al., 2021; Iheduru-Anderson, 2020; Sharma et al., 2021). The pandemic initially emerged as a crisis with unknown information on the virus and no vaccine development. Over time, a vaccine was developed and data on the transmission of the disease was more available. By this time, however, a significant number of nurses had left the bedside, patient-nurse ratios changed, and patient acuity and length of hospitalization increased. The articles that focused on specific points or events during the pandemic do not reflect the changes in COVID-19 health concerns or stress that may have occurred at different phases of the pandemic. Studies that can be conducted or repeated later would be beneficial as the pandemic effect continues and COVID-19-related stress manifested itself in different ways at different stages in the pandemic.

Recommendations

Recommendations for future research include addressing limitations identified in the existing research and expanding the scope of new research. It may be beneficial to have more U.S.-specific studies as the U.S. is leading statically in COVID-19 cases and COVID-19 deaths. Additionally, having more studies done on the pandemic and its effect on the nursing profession can solidify arguments needed to make necessary changes within the healthcare system to strengthen it, such as mandating patient-nurse ratios, ensuring units have safe and adequate staffing and PPE, and ensuring that acute care nurses feel unconditionally supported as they respond to emergencies around the clock. This can create a better quality of work life for nurses and a higher quality of care for patients, as the staff can function in a safer environment with more resources and a manageable workload.

The COVID-19 pandemic has been shown to have permanently altered the work environment for nurses in the acute care setting as well as the well-being of and number of working bedside nurses It would be beneficial to prioritize nurses' well-being and study their experiences during the pandemic to protect the largest healthcare professional group we have and protect those whom this group cares for. If the nursing profession continues to experience adverse psychological events from COVID-19-related stress, such as mental assault and trauma, the consequences of the pandemic will outlive the crisis of the pandemic itself.

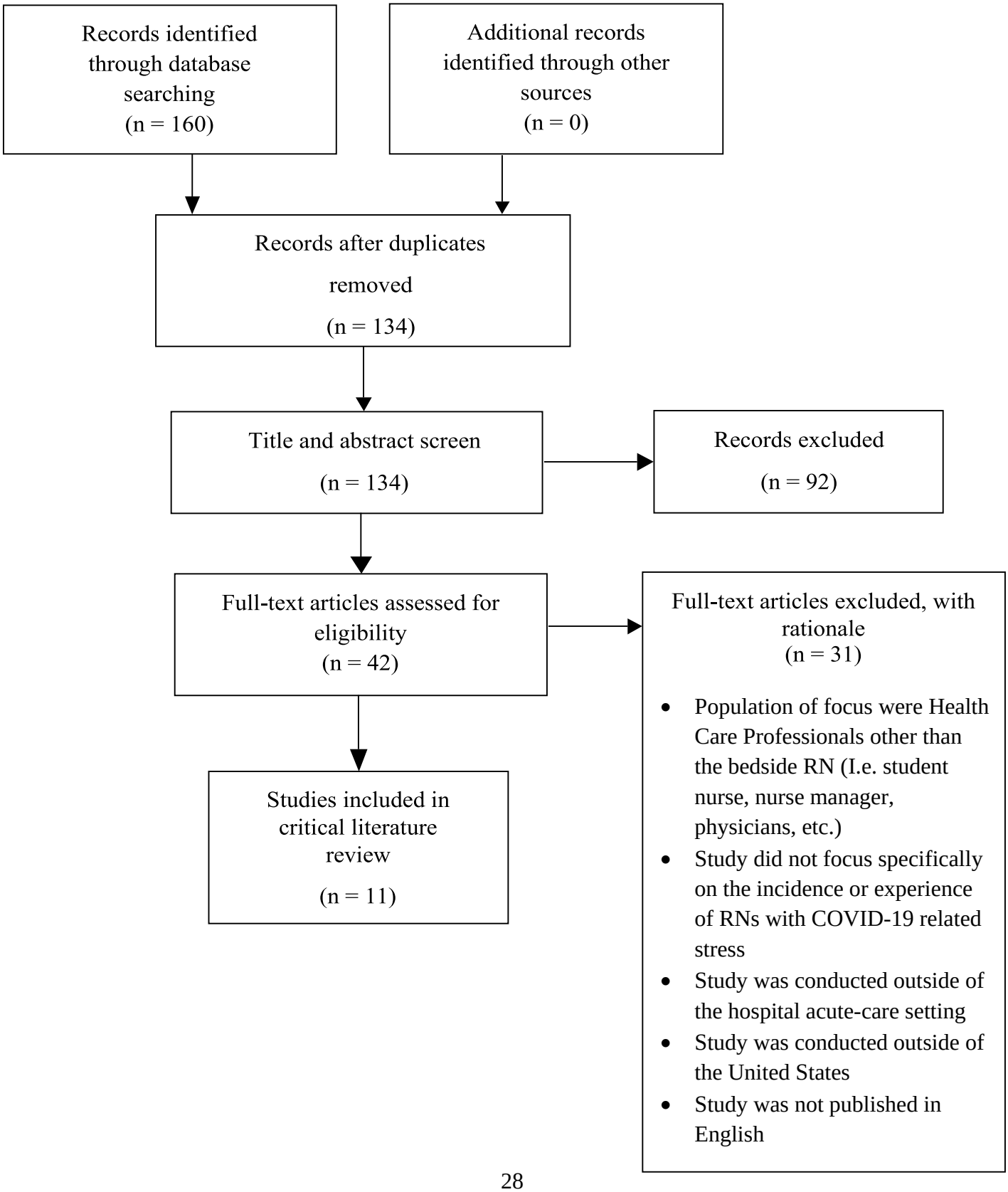
Conclusion

This literature review suggests that COVID-19-related stress in the nursing profession in the United States produced acute and chronic stress responses. Nurses were at the forefront of working the COVID-19 pandemic and experienced negative emotions such as burnout, stress, anxiety, and depression. Nurses experienced stress related to lack of PPE, direct contact with COVID-19 positive patients, being isolated from others due to fears of infecting them with COVID-19, difficult working conditions, and working in specialty areas such as in the ICU.

This literature review has established that COVID-19-related stress has created a range of negative emotions among acute care nurses, including insomnia, fatigue, and feelings of abandonment. The review has addressed the importance of expanding and continuing research related to this topic. The next step is to produce more comprehensive and inclusive data, with research conducted over longer periods of time and more connections made among existing research. The commonalities and key data from this research can be compiled into a list of factors triggering COVID-19-related stress and be utilized as a tool for hospital management to evaluate staff stress responses at work as the pandemic continues. With this tool, management can see which areas are of most concern to staff and can respond to the appropriate crises, mitigating trauma and stress among staff and potentially reducing the amount of burnout and loss of nurses working at the bedside. The tool can also be utilized in the future if another crisis or emergency response occurs within the healthcare system and staff are at risk of prolonged, highly stressful situations again.

Appendix A: Selection Method of Literature

FIGURE 1: The Selection Method of Literature



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