A Capstone Project

Entitled

Burnout Among Various Categories of Healthcare Workers in the U.S. Before and During Covid-19 Pandemic: A Systematic Review

By

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ABSTRACT

Introduction

In healthcare, just like in many other occupational fields, burnout is a health and well-being draining phenomenon that manifests in the form of chronic workplace stress, exhaustion or energy depletion, cynicism, elevated mental dissociation, and disengagement from activities that one would normally do (World Health Organization [WHO], 2019).

In the United States, burnout affects about 40% of doctors and nearly half of all nurses (Wan, 2019). However, it is important to note that the burnout problem does not only affect the doctors and nurses. Other specialties within the healthcare field are equally or probably more affected by burnout, as has been reported among neurosurgeons (Shakir et al., 2018), residents, and pharmacists (El-Ibiary et al., 2017).

Purpose

The purpose of this study was to conduct a systematic review of published literature from 2005 through 2021 to understand burnout among various categories of healthcare workers in the United States before and during the COVID-19 pandemic and to explore and identify strategies to mitigate the impact of the burnout problem. Relevant studies were identified from various databases using combinations of relevant keywords.

Results

The review included 21 studies for final synthesis. Results from these studies demonstrated a gradual trend of increase in burnout before the COVID-19 pandemic, but the increase was drastic after the onset of the pandemic. For instance, before the pandemic, the lowest rate of burnout was reported at 13.5% among perfusionists, and the highest was reported at 51.78% found among physicians. However, when the COVID-19 pandemic started, this changed to the lowest rate reported at 42% among critical care physicians and the highest, 84.1%, reported among pathologists and laboratory professionals.

The rise in burnout was linked to increased workload following a high demand for care services by COVID-19 patients. A surge in COVID-19 infections directly translated to high patient-healthcare worker engagement, which proved to have a negative bearing on healthcare workers' effectiveness and well-being.

Burnout causes many healthcare workers to abandon their work and employment, mostly so due to anxiety and fears of contracting COVID-19 and lack of reliable protective equipment, leading to severe staff shortages. As reported by Rodriguez et al. (2020), many healthcare organizations in the United States cannot effectively retain their healthcare professionals because they readily quit their employment due to burnout. It is also important to note that different categories of healthcare professionals experience different levels of burnout. Those who have signs of burnout but still work are faced with challenges of diminished interest in their work, are less productive, and are prone to making errors, and collectively these are grounds for poor service delivery and harm to patients.

To address burnout and its effects and impacts among healthcare workers in the United States, many evidence-based strategies are increasingly being applied. Evidence-based practice requires that an issue be identified and research that has been proven and tested be used to address the problem and ensure improved patient care and outcomes.

Conclusions

Findings from this systematic review are a good addition to the already existing body of reviews, including data on the presence of burnout among various categories of healthcare workers in the United States before and during the COVID-19 pandemic. This review also underscores the need to promote the use of evidence-based strategies to mitigate burnout and its effects and outlines examples of some of these strategies

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List of Abbreviations

COVID-19 ……Coronavirus Disease of 2019

JD-R ……...… ……Job Demands-Resources

MBI ……. ……Maslach Burnout Inventory

WHO …….....World Health Organization

PRISMA …….....Preferred reporting items for systematic review and meta-analysis

PSS ……...… ……. Perceived Stress Score

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Chapter 1: Introduction

Overview

Today, when almost everyone is living a hectic life, people often experience various physical and mental challenges. Some of these challenges are so serious that they progressively grow to a level where they become problems that negatively affect personal and professional lives. Burnout is one such problem and refers to a state of physical, mental, and emotional exhaustion caused by prolonged and excessive stress (Hilton, 2017).

By definition, burnout is a syndrome that manifests as a result of chronic workplace stress that has not been managed effectively (Han et al., 2019). It presents in three dimensions: (1) feelings of exhaustion or energy depletion; (2) increased mental dissociation from one's job, or feelings of cynicism related to one's job; and (3) reduced professional effectiveness, as outlined by the World Health Organization (WHO, 2019).

The syndrome of burnout is measured mainly by the Maslach Burnout Inventory (MBI) tool, which was developed by Maslach and Jackson (1981), and it detects burnout by scoring the following three facets: being exhausted due to emotions, depersonalization, and lack of personal fulfillment. This tool has 22 questions covering all three facets, and when it is used to detect burnout among medical workers, it is referred to as Maslach Burnout Inventory-Human Services Survey for Medical Personnel (MBI-HSS MP).

The burnout phenomenon may occur due to increased job demands or decreased motivation and interest in performing a given job function (Maslach, 1986). The problem is very significant as it reduces the capacity of people to live a regular and enjoyable life, therefore directly affecting employee attitude towards work because they develop a feeling of helplessness, hopelessness, resentfulness, and may become cynical about their work (Adib-Hajbaghery et al., 2012). Also, the problem of burnout affects almost every area of a person's life, including his/her work, home, and social life. Apart from this, burnout may cause

changes in a person's body that may compromise their immunity—thus making them vulnerable to infectious diseases such as common cold and other respiratory tract illnesses (Mohren et al., 2003).

Many people understand and consider burnout as stress, but it is important to note that these two terms are different (Dyrbye et al., 2017). Perceived stress is the feelings or thoughts that an individual has about how much stress they are under at a given point or over a given period. Perceived stress refers to how people interpret their ability to handle situations in their life and their ability to cope with physical or mental stressors and can be measured on a scale originally developed by Cohen (Cohen et al., 1994). While perceived stress occurs as a result of a person being subjected to excessive pressure, burnout is about feeling mentally exhausted and devoid of motivation. Further, in stress, emotions may be overactive, whereas in burnout, emotions are blunt (Kelly et al., 2020).

The National Academy of Medicine reported that burnout affects half of all doctors and nurses (Wan, 2019). Similarly, an earlier study reported in *Medscape Lifestyle* magazine found that the burnout rate among physicians was 40% (Medscape, 2018). The burnout problem is not limited to physicians. Studies have found that nearly 43% of nurses working in United States (U.S.) hospitals have symptoms of emotional exhaustion and that nearly 37% of nurses who were engaged in direct patient care in nursing homes and 33% in hospitals have symptoms of burnout (Reith, 2018; Wan, 2019). In 2010 to 2011, a qualitative study among 19 nurses found that lack of proper logistics, lack of experience, and a shortage of healthcare professionals are some of the factors contributing to high levels of stress and burnout in this profession (Adib-Hajbaghery et al., 2012).

Nowadays, as a way of limiting costs and maximizing profits where possible, most organization managers focus on ensuring that employees work hard and deliver desirable results with limited resources. Because of this, managers may pay less attention to factors that

improve motivation and decrease burnout, despite the fact that motivated and excited employees perform better and pay more attention to their output in terms of quality and volume (Austin-Egole et al., 2020). Therefore, to improve organizational performance, managers need to develop better environments. According to Parent and Lovelace (2018), having better environments implies that the organizations must have clear psychological, social, and physical support structures. The structures need to include all the requirements that assist the employees in delivering to the best of their ability. The organizations must ensure that they have the best environments, proper structures, and better equipment that will allow for effective work processes and adequate resources (Parent & Lovelace, 2018).

On December 31, 2019, China experienced an acute pneumonia outbreak on what would later emerge as a new coronavirus epidemic, which spread rapidly to other nations across the globe yielding socio-economic and political challenges (Jung et al., 2020). WHO declared COVID-19 a concern for public health and a week later declared it a global pandemic (Ali et al., 2020). Despite being declared a global pandemic and efforts made to curb its spread, the rate of infections increased progressively, with more than 8.5 million cases and 457,000 deaths reported globally by June 25, 2020 (Jebril, 2020). The high number of infections and rapid spread of the virus resulted in an exponential increase in the need for healthcare, therefore resulting in increased workload, which had monumental health effects on various healthcare workers.

Radic et al. (2020) stated that employees require the right job challenges, work resources, and social support to be effective. That means for workers to perform effectively, there must be a good balance between the work challenges they are subjected to and the resources they are provided with to do the work. Failure to establish this balance will result in an environment characterized by factors that may lead to anxiety, depression, suicide ideas, professional errors, and near misses (Koutsimani et al., 2019). This phenomenon is currently

being witnessed in healthcare settings across the world, mainly because of the COVID-19 pandemic (Liang et al., 2020).

In the course of the current COVID-19 pandemic, adjustments in operations have led to excessive negative psychological impacts on healthcare workers, resulting in staff burnout (Ung, 2020). Too much stress and excessive workload, as well as limited resources in these times of COVID-19, have led to healthcare workers experiencing burnout, which includes psychological distress and posttraumatic stress (Liang et al., 2020). For instance, a study of nurses working in the COVID-19 wards at a university hospital in Germany reported higher levels of stress, exhaustion, and depressive mood, as well as lower levels of work-related fulfillment compared to their colleagues working in regular wards without COVID-19 patients (Zerbini et al., 2020). A similar study found that the healthcare workers most affected by stress due to the COVID-19 pandemic were nurses at a rate of 51.3%, followed by physicians at 45.7% (Chor et al., 2020). A related study in Singapore showed that in the course of the COVID-19 pandemic, allied health professionals and other hospital staff are more at risk for depression and anxiety than other medical workers (Tan et al., 2020).

Statement of the Problem

According to research conducted by Austin-Egole et al. (2020) and Gemeda and Lee (2020), management teams of most current organizations tend to focus on cost-saving and maximum resource utilization and put less attention on human resource well-being and motivation. Yet, these managers expect their personnel to show initiative, be proactive, and engage in their activities enthusiastically (Gemeda & Lee, 2020). If there are sufficient personnel and job resources to meet the demanding nature of their work, they register increased employee engagement (Kwon & Kim, 2020). This is consistent with the findings of another study that found that an engaged employee has a fulfilling and positive state of mind

that promotes determination and absorption. These are necessary qualities for workers to succeed at their duties (Russell et al., 2018).

Apart from burnout being harmful to the affected individual, Liang et al. (2020) acknowledged that it may also lead to suboptimal patient care due to lack of morale and employee engagement. When analyzed properly, the burnout and employee engagement concepts enable us to appreciate the job demand-resources (JD-R) theory because it provides context to employees' well-being (Hakanen et al., 2006). Kwon and Kim (2020) noted that the decision-makers should understand what engages workers because it is beneficial to both the organization and employees. This is so because the organization benefits in terms of increased productivity. In their work, Albrecht et al. (2018) expounded that employees who are often facing new challenges are usually committed to high-performance levels and competently generate positive feedback from their seniors and customers.

Although many studies have shown that the COVID-19 pandemic has aggravated the presence and severity of burnout, little has been done to explore and identify strategies used to mitigate this impact, especially among healthcare workers in the United States (Khasne et al., 2020). This study, therefore, is informed by the need to address the necessity and urgency for addressing challenges that seem to have been worsened by the COVID-19 pandemic and to explore evidence-based strategies to mitigate this problem.

Purpose and Significance of the Study

The study's main purpose was to conduct a systematic review on burnout among various categories of healthcare workers in the United States before and during the COVID-19 pandemic and explore and identify strategies to mitigate the impact of the burnout problem. Although previous systematic reviews have been published, those reviews are mainly focused on burnout among healthcare workers in general or in one specialty. They do not synthesize the available literature to bring out clear evidence about prevalence of burnout

and its effects before during the COVID-19 pandemic. Consequently, there was a need to undertake a more thorough systematic review with broader inclusion criteria on the types of studies ranging from a time period before the COVID-19 pandemic to the current time. This way, this review captures more studies to provide more and recent data on burnout and its interplay with the COVID-19 pandemic regarding its effects/impacts on key spheres of life for people working in the U.S. healthcare settings.

This systematic review includes literature published from the last 16 years (2005 through 2021). It includes data on burnout and the COVID-19 pandemic among various specialty categories of healthcare professionals in the United States.

Research Questions and Objectives

The review addressed the following primary question and specific questions (Q):

Primary Research Question

What does the literature reveal about burnout among the various categories of healthcare workers in the United States before and during the COVID-19 pandemic?

Specific Research Questions

Q1 What are the effects of burnout on various categories of healthcare workers in the United States?

Q2 What is the impact of COVID-19 on burnout of various healthcare workers in the United States?

Q3 What are the strategies applied to reduce burnout among healthcare workers in the United States?

Objectives

- To understand the impact of the COVID-19 pandemic on the development of burnout amongst healthcare workers.

- To explore strategies applied to overcome the effects of burnout among healthcare workers in the United States.

Research Scope

The scope of the research was confined to the United States alone. Also, the study included literature published before and during the COVID-19 pandemic and included literature related to evidence-based strategies to improve the presence of burnout among healthcare workers.

Chapter 2: Review of the Literature

In the last three decades, the body of research related to job burnout has been expanding progressively (Corin et al., 2016). Consequently, the problem of job burnout has been found to be closely related to job resources, job demands, and employee engagement (González-Romá et al., 2006). Additionally, Liang et al. (2020) found that besides being harmful to the affected persons, burnout may also lead to suboptimal patient care due to lack of morale and employee engagement.

When analyzed properly, the burnout and employee engagement concepts enable us to appreciate the job demand-resources (JD-R) theory because it provides context to employees' well-being (Hakanen et al., 2006). This may provide an excellent foundation upon which we can explore the extent of burnout before and during a pandemic infectious disease such as COVID-19 and the strategies to mitigate its impact.

Historical Perspective of Burnout

The term burnout was first described by Freudenberger in the mid-1970s in his work describing the systematic and gradual loss of motivation and emotional depletion among workers for aid organizations in some localities in New York (Freudenberger, 1974). He defined burnout as a state of physical and mental exhaustion caused by the physical and emotional demands of work.

In the following years, Maslach and Jackson (1981) conducted a fact assessment survey on stress among human-services workers in California and used the term "burnout" to indicate the developing of negative attitudes, feelings of exhaustion, and feeling that there was a lack of professional competence needed to help their clients. Based on the interviews, Maslach and Jackson defined burnout as a syndrome characterized by emotional exhaustion, depersonalization, and lack of personal accomplishment (1981). By definition, emotional exhaustion is a feeling of being emotionally drained by an employee's work that otherwise he

or she normally does with ease and passion. On the other hand, depersonalization refers to an altered state of self-awareness and identity that results in a feeling of dissociation or separation from work duties and interaction with others at work (Bakker et al., 2014).

As a result of many years of research in the field of burnout, a great deal of information now exists about the concept of burnout. Consequently, the meaning has undergone many changes and revisions, and this has caused it to expand into more present-day diverse fields of practice (Maslach et al., 2001; Schaufeli & Bakker, 2004). This phenomenon does not only occur in collegial work environments of professionals such as healthcare providers, teachers, social workers, and nurses as originally thought but in all fields of work environments (Hakanen et al., 2006).

This expansion of meaning and discovery of burnout across nearly all fields of work environment has been described mainly through the use of the burnout survey tool or Maslach Burnout Inventory General Survey (MBI-GS) tool, which was developed by Maslach and Jackson (1981). Consequently, Maslach and Jackson (1981) defined burnout as a phenomenon that manifests in the form of emotional exhaustion, depersonalization, and or decreased personal accomplishment among affected employees. Ellis and Abbott (2012) described burnout as a problem characterized by the feeling of decreased work effectiveness, fatigue, cynicism, the rapid growth of negative attitudes and behavior, as well as loss of interest in duties and responsibilities that an employee would normally enjoy doing. This characterization accurately confirms the previous description of the burnout phenomenon presenting in the form of emotional exhaustion, depersonalization, and or decreased personal accomplishment (Maslach & Jackson, 1981).

Burnout at the Workplace

In the early days, research into the burnout phenomenon was directed towards employees in healthcare services because these occupations were considered challenging and

emotionally demanding (Bakker et al., 2014). Rupert and colleagues (2015) further echoed this, who reported that work that involves aiding and serving other people who are in poor health and in dire need of help can be stressful and physically demanding.

The effects of burnout are widespread, considering that it can negatively affect one's performance at work and one's quality of life outside of work (Rupert et al., 2015). This is so because burnout is not only harmful to the employee, but it also has spiraling secondary detrimental effects on patients, clients, family members of patients, and guests (Morse et al., 2012; Rupert et al., 2015). The most noted dimension of burnout is depersonalization, which can lead to emotional exhaustion or disengagement of healthcare providers from their clients (Maslach & Jackson, 1981).

In the fields of psychology and occupational health sciences, burnout is viewed as an occupational mental-health impairment (Awa et al., 2010; Golonka et al., 2017), which aligns with research findings that had previously reported that burnout is often characterized as depression and anxiety (Freudenberger, 1975). Subsequently, other studies reported that burnout is not only distressing but can also present itself in many other physically and mentally depleting forms such as fatigue, exhaustion, and depression (Maslach et al., 2001; Morse et al., 2012).

In a meta-analysis study, Lee and Ashforth (1996) reported that burnout was most accurately predicted by job demands and that these demands are aspects of the job that require sustained emotional, physical, or cognitive effort. It is therefore not surprising that another meta-analysis study by Bakker and colleagues (2000) found that job demands are associated with elevated physiological processes such as blood pressure, hormonal activity, and heart rate, as well as remarkable psychological costs, which may include fatigue, exhaustion, and depression. This is because prolonged exposure to high job demands leads to chronic exhaustion and psychologically being disengaged from work. Subsequently, this may

lead to absenteeism, decreased morale, reduced efficiency and performance, social withdrawal, and inability to control the expression of emotions, all of which are manifestations of burnout (Ahola et al., 2008; Gorgievski & Hobfoll, 2008; Shirom et al., 2005; Taris, 2006). These studies, like many others on burnout syndrome in various healthcare studies, did not take a categorical look at burnout in healthcare professionals and were conducted long before the COVID-pandemic started.

According to Maslach and Leiter (2005), burnout occurs due to one or more of the following conditions: control (micromanagement, lack of influence on the part of employees); workload (too much work and lack of sufficient resources); absence of rewards (not enough renumeration); community (disrespect, isolation, conflict); lack of fairness (favoritism and discrimination); and lack of values (ethical and cultural conflicts). To this end, Demerouti et al. (2001) noted that burnout can occur as a mismatch between the individual employee and the environment in which the individual is working, and that physically, emotionally, or cognitively demanding tasks are very likely to lead to burnout of employees.

Burnout of employees at any level in any department of an organization can lead to potentially serious consequences for the staff and clients; the success of the organization can be affected (Ermak, 2014). This is aligned with work previously reported by Micklevitz (2001), in which he concluded that a stressful work environment with limited or no opportunity for personal growth and giving little or no support to its employees can lead to burnout, more so if the workload is excessive or considered disproportional.

In some organizations, burnout has been reported to closely correlate with increased drug abuse, personal care neglect, uncontrolled alcohol consumption, and domestic violence (Bakker et al., 2004; Dimitrios & Konstantinos, 2014). Ultimately, burnout negatively affects

an organization's workforce since it affects employees' self-esteem and depletes their positive energies, leading to poor work performance (Pulcrano et al., 2016).

Job Demands-Resources Theory

The job demands-resources (JD-R) theory was developed by Demerouti and . colleagues (2001). It was built on a model that proposes that working conditions can be broadly categorized into job demands and job resources. These two categories are differentially related to specific outcomes. The JD-R theory states that when job demands are high, and job resources are low, burnout occurs and manifests in the form of exhaustion, stress, disengagement, and cynicism (Demerouti et al., 2001). In the JD-R model, it is assumed that the nature and type of occupations may directly impact the severity of burnout that develops when job demands are high and when job resources are not proportional to job demands. This is the case as discouraging working conditions lead to gradual energy depletion and decrease employees' motivation (Bakker et al., 2014).

According to Bakker et al. (2012), the JD-R theory is an amalgam of principles taken from the motivation-hygiene theory, also referred to as the two-factor theory (Alshmemri et al., 2017), the job characteristics model (Lee-Ross, 1998), the demands-control model (Karasek, 1979), and the effort-reward imbalance model (Siegrist, 1996). The JD-R theory has often been used to predict organizational commitment, job burnout, work enjoyment, and work engagement (Bakker et al., 2012). Also, the founding researchers urge that the theory can be used to predict undesired outcomes such as absenteeism and poor job performance. They stated that the theory can be used to make predictions about employee well-being in the form of burnout, work engagement, job performance, overall well-being, and motivation. Further, Bakker et al. (2012) explained that the JD-R helps in identifying causal effects and their reversal, depending on the environment in which employees are operating, and the

interventional efforts applied either by organizational management or by employees themselves (Bakker et al., 2012).

JD-R Model Construct

The JD-R theory is comprised of two compartments or job environments; that is, job demands and job resources, which constantly play into each other to influence the overall outcome at the individual employee level and at the organization level (Demerouti & Bakker, 2011). Job demands are the physical, social, organizational, or emotional aspects of stress employees encounter in the course of doing their work. They include time pressures, heavy workload, a stressful working environment, role ambiguity, and poor relationships, and these aspects are associated with physical and/or psychological costs to the employees (Xanthopoulou et al., 2007). Also, technological demands have emerged that pose another challenging job demand to employees, especially due to their constantly evolving nature, which employees have to keep abreast with (Bakker et al., 2003). Table 1 illustrates variables in the job demands and job resources constructs.

Table 1

Detailed Outline of JD-R Model Variables

Job Demands	***Job Resources***	***Personal Resources***	***Outcome***
• Centralization	• Advancement	• Emotional and mental competencies	**Positives**
• Cognitive demands	• Appreciation	• Extraversion	• Extra-role performance (self- or other-rated)
• Complexity	• Autonomy	• Optimism	• Innovativeness
• Computer problems	• Craftsmanship	• Intrinsic motivation	• In-role performance (self- or other-rated)
• Demanding contacts with patients	• Financial rewards	• Low neuroticism	• Life satisfaction
• Downsizing	• Goal clarity	• Need satisfaction (autonomy, belongingness, competence)	• Organizational commitment
• Emotional demands	• Information		• Perceived health
• Emotional dissonance	• Innovative climate	• Resilience	• Positive work-home interference
• Interpersonal conflict	• Job challenge		• Service quality
• Job insecurity	• Knowledge		• Team sales performance

• Negative spillover from family to work	• Leadership	• Workability
• Harassment by patients	• Opportunities for professional development	• Happiness
• Performance demands	• Participation in decision making	**Negatives**
• Physical demands	• Performance feedback	Absenteeism (self-report and company registered)
• Problems planning	• Positive spillover from family to work	• Accidents and injuries
• Pupils' misbehavior	• Professional pride	• Adverse events
• Qualitative workload	• Procedural fairness	• Depression
• Reorganization	• Positive patient contacts	• Determination to continue
• Remuneration	• Quality of the relationship with the supervisor	• Unsafe behaviors
• Responsibility	• Safety climate	• Physical ill health
• Risks and hazards	• Safety routine violations	• Turnover intention
• Role ambiguity	• Social climate	
• Role conflict	• Social support from colleagues	
• Sexual harassment	• Social support from supervisor	
• Time pressure	• Skill utilization	
• Unfavorable shift work schedule	• Strategic planning	
• Unfavorable work conditions	• Supervisory coaching	
• Work pressure	• Task variety	
• Work-home conflict	• Team cohesion	
• Work overload	• Team harmony	
	• Trust in management	

Derived from: Schaufeli & Taris (2013). A critical review of the job demands-resources model: Implications for improving work and health. In *Bridging Occupational, Organizational and Public Health* (pp. 43-68).

On the other hand, job resources are those physical, social, or organizational aspects of the job that help employees achieve goals and reduce stress. They include strong work relationships, autonomy, coaching and mentoring, opportunities for advancement, and learning and development (Lesener et al., 2019). These are key in enabling employees to achieve work-related goals because they buffer or reduce the effects of job demands and the associated physiological and psychological costs (Bakker et al., 2003). Additionally, according to Demerouti and Bakker (2011), personal resources are an additional aspect of

resources because they help an employee in positively navigating between job demands, job resources, and the general work environment. This therefore suggests that personal resources are an essential component of the resources needed to overcome the effects of job demands.

JD-R Model Applications

The JD-R model serves as the guiding principle for an organizational development process that aims to prevent burnout and increase work engagement. This is so because the JD-R model is capable of analyzing and understanding both stress-prone processes and motivational processes (Schaufeli, 2017). This balanced approach is a crucial asset to easily applying the JD-R model to various organizational settings. It integrates an employee health approach by reducing job stress and burnout with a human resource management aspect by increasing employee motivation and engagement (Schaufeli, 2017).

Because of its flexibility, the JD-R model can be applied in various types of organizations and settings with a wide range of job and employee characteristics that can lead to various outcomes (Dimitrios & Konstantinos, 2014). The combination of flexibility, wide breadth, and specificity are very important attributes of great practical significance, therefore another good reason for wanting to engage the JD-R model when there is a need to investigate employee well-being and organizational success. Also, the JD-R model provides another important organizational and workforce management model that facilitates taking a closer look at the dynamics of work and employee well-being (Schaufeli, 2017). Indeed, other studies, such as Rosleea and Effendib (2018), associated employee engagement with improved innovation resources, profits, and customer service. These findings concur with Verbruggen et al. (2015), who established that most employees who develop burnout are often absent from work and experience increased health problems. They are never interested in their work and hence never see the organization’s positive side. Kwon and Kim (2020) also argued that disengaged employees often caused companies to incur so many costs to the tune

of 35% of their payrolls. Burnout and disengagement have a serious impact on the productivity of many organizations.

Healthcare Services in the Midst of the COVID-19 Pandemic

Healthcare systems at the center of the COVID-19 pandemic are significantly affected by burnout. Institutions have to operate under the most challenging conditions associated with extremely increased workload and constrained resources supply chains (Huang et al., 2020).

The causes of burnout during the COVID-19 pandemic include the anxiety of being infected owing to increased viral load, prolonged work hours, and increased risks of exposure to a highly infectious and significantly lethal disease (Huang et al., 2020). In the Huang et al. (2020) study, the other concerns that emerged as a great concern to the healthcare workers included stress, depression, and anxiety. Likewise, Lai et al. (2020) established that healthcare workers in charge of the COVID-19 patients had several symptoms, including depression, anxiety, distress, and insomnia. Their exposure led to a severe stress reaction, which, if unmanaged, may lead to secondary trauma development (Lai et al., 2020). While stress, fatigue, and higher amounts of workload may have serious impacts like musculoskeletal disorders, the conditions have remarkable effects contributing to higher levels of burnout in healthcare settings (Lai et al., 2020). The risk of acquiring the virus among the healthcare workers and families leads to anxiety and ultimately may lead to burnout as persons handle tasks that require endurance and extreme mental alertness for prolonged worked hours.

In Wuhan, China, a study examined the psychosocial impact of COVID-19 on frontline healthcare workers and found that more than half (59.0%) had moderate to severe levels of perceived stress (PSS scores ≥ 14), and depression and anxiety symptoms were

more common among those healthcare workers who were less psychologically prepared due to lack of social support through family and colleagues (Du et al., 2020).

Not only has there been a rise in anxiety related to COVID-19, but healthcare professionals are also dealing with significant and diverse issues (Joshi & Sharma, 2020). Family life and its dynamics have been negatively affected, resulting in a significant rise in marital conflicts and domestic violence, especially towards women (Joshi & Sharma, 2020).

A prior study had found that inadequate resources are associated with a feeling of excessive workload among workers and students and that this resulted in demoralization and decreased performance (Biggs et al., 2014). Indeed, some institutions aim to prevent this form of burnout by improving their students' and workers' engagement through ensuring availability and utilization of necessary resources (Madigan & Curran, 2020). But nowadays, because of the COVID-19 pandemic, ensuring availability and a steady supply of needed resources is a considerable challenge to many institutions.

In a study done by Khasne et al. (2020) in India, it was established that there was a significant upsurge in pandemic-related burnout compared to before the COVID-19 pandemic began. The researchers established that the pandemic-related burnout levels among healthcare workers are significantly higher, that is, 51.37% compared to reported work-related burnout of 39.69%, with a < 0.05 p-value (Khasne et al., 2020). Also, this study showed that the prevalence of work-related burnout among paramedics, nurses, and doctors was similar, but the support staff registered a slightly lower occurrence of burnout at 14.3% and 10.7%, respectively.

In China, a study about the impact of social support on mental health for 180 physicians and nurses who were treating COVID-19 infected patients at Wuhan University School of Medicine showed that these healthcare workers had high levels of anxiety, stress, and diminished self-efficacy. This was mainly due to excessive work demands in the form of

prolonged working hours, constrained logistical supplies, an overwhelming number of patients, and a lack of sufficient quality sleep and social support (Xiao et al., 2020).

In summary, JD-R theory suggests job demands and job resources are two compartments of work environment that healthcare workers experience in the course of doing their day-to-day work of caring for patients. The onset of the COVID-19 pandemic has offset the natural balance by causing excessive workload and diminished resources.

Gaps in Literature

Before this review, no study had comparatively examined burnout among various categories of healthcare workers in the United States before and during the COVID-19 pandemic. Nearly all the studies done had been about the effect of burnout on the health workers as a whole without focusing on the different categories of healthcare workers. Researchers had not taken a look at the differences in burnout levels before and during the pandemic, and no evidence-based mitigating strategies had been highlighted. This review fills this gap and lays a firm ground for future studies on burnout and its associated problems among healthcare professionals.

Chapter 3: Methodology

This research project was a systematic review of published literature regarding the prevalence of burnout and its effects among healthcare workers in the United States before and during the COVID-19 pandemic. The general impression is that during the pandemic, healthcare workers are working under more challenging conditions and for longer shifts than they did before the pandemic. This project aimed to answer one primary research question: "What does the literature reveal about burnout among the various categories of healthcare workers in the United States before and during the COVID-19 pandemic?" From this, three specific questions were to be answered.

1. What are the effects of burnout on various categories of healthcare workers in the United States?
2. What is the impact of COVID-19 on burnout of various healthcare workers in the United States?
3. What are the strategies applied to reduce burnout among healthcare workers in the United States?

Database Search

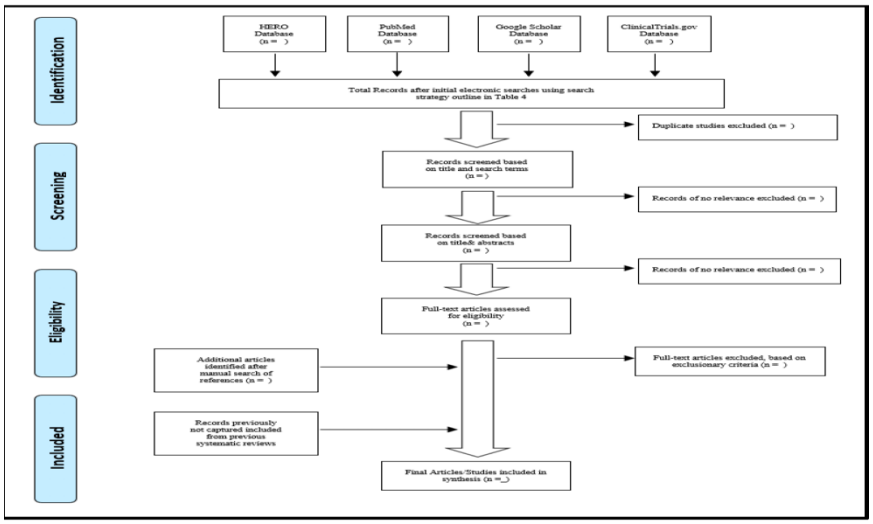
In searching for data to answer these questions, relevant publications in Google Scholar, PubMed, MEDLINE, CINAHL, Web of Science Ovid, and Scopus were identified mainly by using the portal of Radford University McConnell Library. In addition, websites of trusted organizations and institutions such as the World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC) were searched to identify literature related to job burnout, healthcare workers, and literature related to COVID-19 and strategies to mitigate its impact. These databases were selected because they are repositories for numerous scientifically credible research articles about the current study topic; they are regularly

updated with new information, and therefore, are reliable sources for up-to-date literature. The timeframe for the literature search was from the year 2005 through 2021.

The search strategy aimed to capture all relevant published literature. Because this project was a systematic review of existing data, neither Institutional Review Board approval nor sample size calculations were required. To maximize results, the search strategy included the use of keywords in various combinations and phrases. The search was limited to studies conducted in the United States with publications in peer-reviewed academic journals written in English. The publications selection process was recorded according to and in compliance with the Preferred Reporting Items for Systematic Reviews guidelines, or PRISMA (Moher et al., 2009), shown in Figure 1.

Figure 1

Draft Prisma Flow Diagram



Note. Systematic Review Process and Flow Adapted from PRISMA Flow Diagram by Moher, Liberati, Tetzlaff, & Altman (2009).

Keywords/Phrases and Boolean Operators for Data Extraction

The keywords, phrases, and Boolean operators that were used are as follows: Burnout AND healthcare workers, Burnout AND COVID-19, COVID-19 AND United States,

COVID-19 AND strategies, Exhaustion AND COVID-19 in the United States, stress AND healthcare workers in the United States, COVID-19 AND healthcare workers in the United States, “burnout” OR “fatigue” OR “exhaustion” OR “tiredness” OR “weariness” AND “healthcare workers” OR “healthcare professionals” OR “healthcare practitioners” OR “nurses” OR “physicians” OR “psychiatrists” OR “psychologists” OR “paramedics” AND “united states” OR “US” OR “burnout” AND “strategies.”

The number of records identified throughout the initial electronic data searches of each database was recorded, and duplicate publications were excluded. This was followed by assessing the title of each publication and excluding articles with irrelevant titles. The next step was to assess the abstracts of publications with relevant titles and exclude publications whose abstracts did not match the inclusion criteria. This was followed by reviewing the reference section of each article found to determine if any additional articles or studies valid for this review would be considered for inclusion to be part of those articles that were chosen for the final synthesis.

Finally, all the publications considered for inclusion and treated as “relevant” were compiled into a table and synthesized with interest in understanding their characteristics such as authors of the publication, type of study and design, sample size, job demand and resources, healthcare worker category, the prevalence of burnout, results/conclusions, and interventions/strategies. Table 2 provides a template of the data extraction table.

Table 2

Template of the Data Extraction Table

Author /Date	**Study Design/Methods**	**Sample**	**Job Demand and Resources**	**Healthcare worker Category**	**Prevalence of burnout**	**Results/ Conclusion**	**Interventions /Strategies**

Each study was summarized into a table highlighting the title of the study, the way it was designed, how big or small the sample size was, the job demands and resources in place, who were affected by burnout, and the interventions or strategies to curb the problem. Based on the data collected and assessed during this systematic review, conclusions and recommendations regarding the problem of burnout among healthcare workers in the United States were made with the aim of understanding the magnitude of the problem and possible strategies to mitigate it.

Detailed Illustration of Studies for Inclusion and Exclusion

To ensure that studies before and after COVID-19 are generated, the inclusion criteria included studies that have been published between the years 2005 and 2021 (last 16 years). This timeframe enabled us to review studies covering burnout both during the COVID-19 pandemic and pre-pandemic. Also, only studies covering U.S. healthcare workers were included in this review. The inclusion/exclusion criteria are shown in Table 3.

Table 3

Inclusion and Exclusion Criteria

Inclusion	Exclusion
Studies published between 2005 and 2021.	Studies published before the year 2005 and after 2021. Duplicate articles
Studies exploring burnout in healthcare workers in general or specific specialties such as physicians, nurses, radiologists, pathologists, laboratory professionals, etc.	Studies focused on other issues besides burnout on healthcare workers before and during COVID-19
Studies addressing evidence-based strategies to mitigate burnout in healthcare workers	Studies addressing burnout mitigation strategies in fields other than healthcare
Studies covering burnout before and/or during COVID-19.	Studies neither address burnout nor healthcare workers.
Studies that covered the US healthcare workers	Studies that address burnout in other geographical locations
Studies in the English language	Studies in languages other than English

The exclusion criteria included studies that address burnout in other professions than those considered to be healthcare, studies that focused on other issues affecting healthcare

workers before and after COVID-19, and studies that neither addressed burnout nor healthcare workers.

Coding

For effective use and complete application of all keywords and phrases, a coding protocol (shown in Table 4) was developed and used to review selected studies. This was used primarily to ensure data extraction accuracy.

Table 4

An Illustration of the Coding Strategy Layout

Study Author and year	Is the study peer review ed?	study in English?	Does the publication date fall in the year 2005 – 2021 period?	Does the Study cover burnout before and/or during COVID-19	Was the study about burnout in healthcare workers in general or specific specialty?	Did the study address evidence-based strategies to mitigate burnout in healthcare worker	Did the study cover the US healthcare workers?	Exclusion criteria absent?

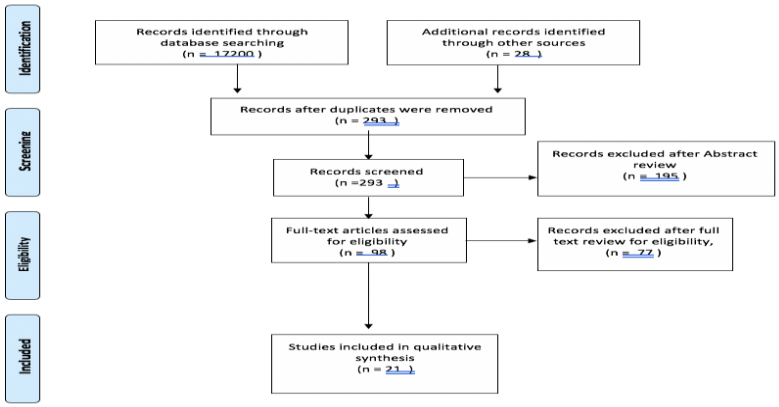
Chapter 4: Results

In this study, the student researcher conducted a systematic review of literature in the English language guided by the PRISMA framework to identify publications reporting burnout among United States healthcare workers before and during the COVID-19 pandemic. An initial search yielded a total of 17,228 records through database searching from the year 2005 through 2021. This number was later reduced to 293 after applying delimiters and removing duplicates. On abstract review, the next step in the screening process excluded 195 papers for not meeting the inclusion criteria, leaving 98 full-text papers that were further reviewed. After further review, 77 more articles were excluded because they fell short of the requirements for inclusion.

The search and review process ended with only 21 articles that, after full-text evaluation, were included in this study. The remaining 21 studies were then subjected to qualitative synthesis. Below is a PRISMA flow diagram illustrating the data search process.

Figure 2

Completed PRISMA Flow Diagram



Note. Completed Systematic Review Process and Flow Diagram. Adapted from Moher, Liberati, Tetzlaff, & Altman, 2009.

Final articles that were included in this study review are those that met the inclusion criteria listed in Table 2 and are as follows: cover the topic on burnout in healthcare workers

in the United States, in the 2005 to 2021 timeframe, published in a peer-reviewed journal or credible online source, presented in the English-language, and those including content on the COVID-19 pandemic. The articles that were considered for inclusion into the review were subjected to qualitative review and synthesis as outlined in the matrix table in Appendix A.

Of the 21 articles included in the review, three were systematic reviews (Abraham et al., 2020; Heath et al., 2020; Reith et al., 2018), and 18 were survey studies (Bui et al., 2011; Demirjian et al., 2020; Durham et al., 2018; Helfrich et al., 2014; Garcia et al., 2020; Gomez et al., 2020; Grace & VanHeuvelen, 2019; Han et al., 2019; He et al., 2020; Hilton, 2017; Jha et al., 2020; Kroft et al., 2020; McHugh et al., 2011; Prasad et al., 2022; Roberts et al., 2020; Rodriguez et al., 2020; Sasangohar et al., 2020; Shanafelt et al., 2012).

In this review, a variety of healthcare workers were represented. For instance, eight of the studies focused on physicians (Abraham et al., 2020; Grace & VanHeuvelen, 2019; Han et al., 2019; Heath et al., 2020; Helfrich et al., 2014;Jha et al., 2020; Sasangohar et al., 2020; Shanafelt et al., 2012) and three were focused on nurses (McHugh et al., 2011; Prasad et al., 2021; Reith et al., 2018). Radiologists were represented by one article (Demirjian et al., 2020), one article (Durham et al., 2018) was on pharmacists, perfusionists one article (Bui et al., 2011), and one other article was on surgeons (He et al., 2020).

In this review, medical laboratory professionals were represented by two articles (Garcia et al., 2020; Hilton, 2017) and one article (Gomez et al., 2020) represented critical care professionals. Lastly, pathologists had one article (Kroft et al., 2020) and respiratory therapists had one article (Roberts et al., 2020). It is also important to note that roughly half (12) of the studies were completed and published before COVID and nine were published after the COVID-19 pandemic began.

Findings from all 21 studies indicate that COVID-19 led to increased burnout in healthcare workers. Cases of burnout increased among emergency healthcare professionals,

general ward nurses, and physicians. Effects of burnout identified include a high risk of medical errors, depersonalization, and prolonged emotional exhaustion. Managing the condition of burnout was very costly for the U.S. government. For instance, in a cost-consequence analysis using a mathematical model, Han et al. (2019) found that physician turnover and reduced productivity due to burnout in the United States resulted in a cost of approximately $4.6 billion a year. The following paragraphs are a summarized review of the findings for each of the 21 studies.

McHugh et al. (2011) were the first to publish a cross-sectional survey study results in February of 2011, examining data from a survey of 68,724 nurses, revealing that there was high job dissatisfaction and burnout among nurses who were directly caring for patients in hospitals and nursing homes as compared to nurses working in other work settings. Also, this survey showed that patient satisfaction levels were lower in hospitals with more nurses who are dissatisfied or burned out, thus directly implying the existence of problems with quality of care. This study further emphasized the significance of improving nurses' working conditions as it relates directly to quality of care and patient satisfaction. The burnout level was found to be 34% for nurses in hospitals and 37% for those in nursing homes.

In June of the same year, Bui et al. (2011) published a survey study with data regarding stress and burnout among perfusionists. Perfusionists are members of healthcare professionals who are trained to operate and manage cardiopulmonary bypass machines during surgical procedures. The primary aim of this study was to determine the level of stress and burnout among perfusionists in the United States. For this study, a questionnaire was constructed with the use of SurveyMonkey® to assess burnout components of the well-established Maslach Burnout Inventory (MBI) tool (Maslach & Jackson, 1981). Invitations to participate in the survey were distributed by electronic mail to members of PerfList and PerfMail forums of perfusionists in the United States and 336 of them responded. The study

found that job demand variables such as stress level, conflict, call duties, hours worked, and caseload were all shown to have a statistically significant relationship to burnout ($p < 0.05$). According to the study results, job demands were the most likely factors contributing to burnout.

Shanafelt et al. (2012) published another survey about burnout in United States' healthcare professionals, specifically among physicians in relation to the general population. In this study, researchers conducted a nationwide study of burnout in a large sample (N = 7,288) of U.S. physicians from all specialty disciplines using the American Medical Association Physician Masterfile (PMF). The authors surveyed a probability-based sample (n = 3,442) of the U.S. general population for comparison. Using the MBI, 3,338 (45.8%) physicians reported having had at least one symptom of burnout, and 2,762 (37.9%) reported these symptoms as an ongoing problem, compared to the general population where 957 (27.8%) reported having burnout as a current problem. Physicians unsatisfied with work-life balance totalled 2,930 (40.2%) compared to other workers in the United States in general where 799 (23.2%) reported being unsatisfied with work-life balance. The researchers concluded that burnout is more prevalent among physicians than other workers of the U.S. workforce.

Helfrich et al. published a cross-sectional survey study in 2014. This survey was conducted from May through June 2012 to determine if components of a patient-centered medical home (PCMH) in relation to team-based care were associated with lower burnout among primary care team members participating in a national medical home transformation. For this study, data was collected from 4,539 primary care personnel at the Veterans Administration and analysed them for burnout as a dependent variable against independent variables such as time spent in huddles, the delegation of clinical responsibilities, and team staffing. Overall, 39 % of participating primary care workers reported burnout. The study

further showed that having a fully staffed team was associated with lower burnout, while a stressful and fast-moving work environment was associated with higher burnout (OR 4.33, 95% CI 3.78, 4.96). Also, according to this study, medical home models that are appropriately staffed and participatory decision making are some of the key measures that if put in place and emphasized can lower burnout among healthcare workers.

Hilton (2017) published a cross-section study that aimed to examine the effect of burnout on the turnover intention of clinical laboratory employees in Florida. For this study, data was collected from 184 Florida state-licensed clinical laboratory employees out of 1,000 invited participants. Data collection was done using an online Maslach Burnout Inventory – General Survey (MBI-GS) tool and a demographic questionnaire. All participants reported burnout scores > 3.0 on a scale of 0-6 where 0 is no burnout and 6 is the highest level of burnout. Generally, any score $\leq$ 2.0 is considered low, and $\geq$ 3.0 is considered high. The data were analysed using linear regression and analysis of variance (ANOVA) with the Statistical Package for the Social Sciences (SPSS) software. Linear regression analysis results indicated that the relationship between emotional exhaustion and turnover intention was statistically significant, $F(1,182) = 103.215$, $p < .001$. This demonstrated that emotional exhaustion has a positive relationship with turnover intention ($\beta = .602$, $p < .001$). Similarly, the relationship between professional efficacy and turnover intention was statistically significant, $F(1182) = 9.513$, $p = .002$, as shown by the inverse relationship ($\beta = -.223$, $p = .002$), which means that in work environments where employees feel little or no sense of personal accomplishment, chances of such employees quitting their jobs are significantly higher. Also, the results of the linear regression analysis indicate that the relationship between cynicism and turnover intention is statistically significant, $F(1182) = 49.877$, $p < .001$, as shown by the positive relationship ($\beta = .464$, $p = < .001$), implying that in work environments where cynicism thrives, turnover intention is a highly likely possibility because affected employees are

disengaged, less productive, and likely to look elsewhere for an alternative work environment.

Reith published a narrative review in 2018 in which he gave a brief history of burnout and summarized its main causes, effects, and prevalence among U.S. healthcare workers. According to the review, over half of physicians in the United States experience symptoms of burnout and this rate is nearly twice that of workers in other professions, as cited (Marchalik & Shanafelt, 2020). It is observed that overworking or spending too much time at work is one of the reasons burnout is occurring among physicians and other healthcare professionals in the United States. For instance, the average U.S. physician works 51 hours per week, and about 25% of U.S. physicians and nurses work more than 60 hours per week. In addition, the review highlighted some evidence-based strategies that physicians, organizations, and medical institutions can apply to counter the burnout epidemic. For instance, burnout can be prevented or at least reduced by minimizing time spent on bureaucratic tasks (e.g., paperwork, charting), not working long shifts, and ensuring a smooth and gradual computerization of institutional and departmental practices.

Durham et al. (2018) conducted a cross-sectional survey with a primary objective of determining levels of and risk factors for professional burnout among health-system pharmacists. The Maslach Burnout Inventory – Human Services Survey (MBI-HSS) tool questionnaire was distributed via email through a professional network listserve to a target population of health-system pharmacists to assess study participants for burnout characterized by feelings of emotional exhaustion, depersonalization, and reduced personal accomplishment. For this study, an emotional exhaustion score of 27 or greater indicated a high degree of burnout; scores ranged from 0 to 54. A depersonalization score of 10 or greater indicated a high degree of burnout; scores ranged from 0 to 30. Descriptive statistics were used to assess MBI-HSS scores, and risk factors associated with burnout. Out of the N =

371 survey responses received, n = 329 were complete and included in the final analysis. Overall, 175 (53.2%) study participants reported scores indicating a high degree of burnout on at least one subscale of the MBI-HSS. Average scores were 22.9, 6.2, and 36.3 for feelings of emotional exhaustion, depersonalization, and reduced personal accomplishment respectively. Reduced personal accomplishment was inversely associated with burnout; a score of 33 or less indicated a high degree of burnout, with scores ranging from 0 to 48. Only 17.3% of respondents reported availability of institutional resources to address healthcare provider burnout and only 4% reporting utilization of such resources within the past year. The study found that factors that may affect pharmacist burnout in this setting include high census numbers and low pharmacist-to-patient ratios.

Grace and VanHeuvelen published results in 2019 from survey data collected from medical staff in a neonatal intensive care unit (N = 222). The study aimed to assess and contrast the mental health and workplace experiences of four groups of healthcare workers: nurse practitioners, physicians, registered nurses, and respiratory therapists. Burnout was assessed by a modified burnout scale adapted from the emotional exhaustion component of MBI. The study found evidence that higher status healthcare workers such as physicians and nurse practitioners were more likely than their colleagues to report work-life conflict, irregular work hours, and heavy work pressure. These stressors explain an appreciable amount of the higher levels of burnout found among physicians and nurse practitioners. This seems to align with the hypothesis of “the stress of higher status” and provide insights into the job demands and mental health issues confronted by today’s medical workforce.

Han et al. (2019) published findings of a study that was giving insight on a cost-consequence analysis using a mathematical model. The primary aim of the study was to estimate costs associated with burnout in relation to physicians’ turnover and reduction in their clinical hours at national (U.S.) and organizational levels. Model inputs were estimated

by using the results of contemporary published research findings and industry reports. The study found that at the national level approximately $4.6 billion in costs due to physician turnover and that there is a decrease in physician productivity as evidenced by reduced clinical hours due to burnout, which translates to costs ranging from $2.6 billion to $6.3 billion. At the organizational level, the annual economic cost associated with burnout related to turnover and reduced clinical hours is approximately $7,600 per employed physician each year.

Abraham et al. conducted and published a systematic review in 2020 where they identified the predictors and outcomes of burnout among primary care physicians (PCP) in the United States. For this review, 21 studies met inclusion criteria, had sufficient quality, reported personal and/or organizational predictors of burnout, and described burnout outcomes at the patient, provider, or organizational level. The prevalence of PCP burnout ranged from 13.5% to 60%. The primary care practice environment was the most common predictor of PCP burnout. Based on the findings of the study, researchers concluded that a poor or toxic work environment is a recipe for burnout among workers and that developing interventions to improve the practice environment may help reduce PCP burnout, but also called for future studies, especially those using robust study designs and standardized instruments, to measure burnout consistently and accurately.

Garcia et al. (2020) conducted a cross-sectional survey on clinical laboratory professionals to examine their level of job satisfaction, well-being, job stress, and burnout. The survey was administered online via the American Society for Clinical Pathology's survey tool, and N = 4,613 laboratory professionals across the United States participated. This study was reviewed and approved by the institutional review board of the University of Nebraska Medical Center. Over half of the respondents (59.1%) reported that they are not adequately compensated for the work that they do with 31.7% of the respondents reporting that their job

responsibilities/duties do not align well with their job title. The study further found that 53.3% of the laboratory professionals do not think they are as excited about being laboratory professionals as they did when they started their career and about the same number (57.1%) believe they are not appreciated by their institutions. About stress, 53.4% of respondents reported feeling a lot of stress mainly due to excessive workload and 85.3% reported having felt burnout in the course of their work as laboratory professionals. The researchers concluded their report with a recommendation for a comprehensive wellness program developed at the institutional, local, and national levels, which they believe may improve morale and alleviate recruitment and retention challenges faced by healthcare facilities at all levels across the country.

Jha et al. (2020) published survey data where they aimed to assess the presence of burnout specific to the COVID-19 pandemic among practicing interventional pain physicians. The study comprised of 32 questions that were given to the members of the American Society of Interventional Pain Physicians in an online format via a commercially available online marketing company platform. Of N = 179 surveys sent, n = 100 (55.9%) responses were collected. The data from the survey demonstrated that 98% of physician practices were affected by the COVID-19 pandemic and 91% of physicians believed the pandemic had a significant financial impact. Also, 67% of the physicians stated that in-house billing was responsible for their increased level of burnout, whereas 73% responded that electronic medical records were one of the causes. Overall, 78% responded that they had been victims of burnout and were very concerned, and a large number of them (66%) were negative about the entire healthcare industry. Although the survey was based on a small number of interventional pain physicians, the findings do resonate, to a large extent, with findings of studies in other specialties of healthcare. The researchers' survey data paints a picture that confirms the fact that the COVID-19 pandemic has put healthcare practices throughout the

United States under considerable financial and psychological stress. For better planning and better services delivery, it is essential to quantify the extent of economic loss, design, and offer strategies to effectively minimize risks to personnel and promote employee morale and well-being.

Demirjian et al. (2020) published a nationwide survey on COVID-19 and its impact on burnout among radiologists. For this study, a 43-item anonymous questionnaire adapted from the Arbeitsgemeinschaft für Osteosynthesefragen Spine Foundation's survey was distributed to 1,521 email addresses of radiologists using the Research Electronic Data Capture (REDCap™) program. To widen their scope of enrollment, additional invitations were sent out to the Association of University Radiologists and American Society of Emergency Radiology members. Responses were collected over eight days and descriptive analyses and multivariate modeling were performed using Statistical Analysis System version 9.4 (SAS v9.4) software. The enrollment response rate included 689 radiologists across 44 different states of the country. About 61% of respondents rated their level of anxiety concerning COVID-19 to be a 7 out of 10 or greater. The researchers, based on their study findings, concluded that COVID-19 has had a significant impact on radiologists across the nation, and stated that there is a need for further attention to be paid to how we continue to support radiologists working in instantly changed practice environments, more so for those in remote settings.

Gomez et al.'s publication of 2020 serves a great purpose of evaluating and assessing the impact of the COVID-19 pandemic on burnout among healthcare workers in the University of Pennsylvania health system. This was a cross-sectional study that had the objective of examining healthcare professionals' well-being, measured as burnout and professional fulfillment, across intensive care units, critical care centers, and hospitals within a university health system; and examining the impact of the coronavirus disease 2019

pandemic. For this study, N = 481 critical care professionals comprised of nurses, advanced practice providers, physicians, and pharmacists participated in the cross-sectional survey. Overall, burnout was reported across all critical care specialties ranging from 42% to 55% but it was more predominant among advanced practice providers where it was reported at 55%. Professional fulfillment was reported at 37% on average with significant variability across provider specialties, the lowest being 23% among critical care pharmacists and the highest was 53% among physicians. Excessive workload and job demands were identified as drivers of burnout, whereas social support, values, culture of work, control, and flexibility were each identified as promoters of well-being. Also, between July 2019 and March 2020, burnout and professional fulfillment were present in 35% (15/43) and 58% (25/43) of medical critical care physician responses, respectively. In comparison, during the coronavirus disease 2019 pandemic, burnout and professional fulfillment were present in 57% (12/21) and 38% (8/21), respectively, implying that during the pandemic, burnout levels increased and professional fulfillment decreased. In conclusion, researchers noted that burnout was commonly noticeable across all specialties of healthcare professionals and that professional fulfillment also varied.

He et al. (2020) conducted a qualitative study regarding the concerns of general surgery residents in the early phase of the COVID-19 pandemic. The primary aim of this study was to determine the concerns of general surgery residents in the days of the pandemic as they prepare to be in the frontlines of the response against this globally challenging public health problem. To this end, a qualitative study was designed in which focus group interviews were conducted with a total of N = 30 general surgery residents enrolled at two academic medical centers in Boston, Massachusetts. Interviews were conducted between March 12 to 16, 2020. About the COVID-19 outbreak, the study showed that the most common personal concern among the general surgery residents was the health of their family (100%), followed

by the risk of them transmitting COVID-19 infection to their family members (80%). The risk of them transmitting COVID-19 infection to their patients was 63% whereas the anticipated overworking associated with taking care of a high number of patients was found to be 50%. Also, the study found that among general surgery residents, the concern of acquiring COVID-19 infection from their patients was around 27%. There were no differences when responses were stratified by resident training level, gender, and residency program. Researchers concluded with a recommendation for improving general surgery residents' preparedness by institutions putting in place plans that would ensure steady availability of personal protective equipment, increase diagnostic testing capacity, and transitioning to a shift schedule to minimize or prevent burnout, and minimize exposure risks. Also recommended is that surgery departments should protect the physical and psychosocial well-being of general surgery residents to increase their ability to provide care in the difficult times of the COVID-19 pandemic.

Kroft, a medical school professor at the Medical College of Wisconsin – Milwaukee, published an editorial in 2020 where he commented on key features and interesting points regarding burnout among pathologists and laboratory professionals in the United States. He noted that the prevalence of burnout has increased dramatically in the last decade and has now reached epidemic status among healthcare providers. This editorial further brought to light that there is abundant evidence suggesting that burned-out healthcare professionals provide poorer care, they are more likely to make medical errors, and there is low patient satisfaction associated with them. Also, Kroft pointed out that burned-out providers are less productive and are more likely to leave the medical field, therefore causing a shortage of healthcare professionals, increasing hiring and retention costs for healthcare systems in the United States. In this editorial, it was also noted that unlike among pathologists where burnout is about 71%, it is higher among laboratory professionals. Based on Garcia et al.

(2020) study findings, he noted that about 85% of laboratory professionals have experienced burnout at some point, and that half have reported it as a current problem. Excessive workload and limited resources were reported as the promoters of job stress and burnout. Kroft (2020) ended the editorial by calling on healthcare leaders to cultivate and promote work environments and cultures that promote well-being and limit burnout among healthcare workers.

Roberts et al. (2020) conducted a post-hoc analysis of a survey on respiratory therapists. Using data sourced from the Johns Hopkins COVID-19 database as of May 29, 2020, they aimed to make comparisons between states with a higher prevalence of COVID-19 and those with lower disease prevalence. High prevalence was defined as states where disease rates were > 500 cases per 100,000 residents. Based on N = 164 responses from 42 states, 15 states experienced > 500 cases per 100,000 residents. Of the 154 (93%) of the survey respondents who were included in the study, n = 37 responses were from COVID-19 hotspots (areas of high prevalence), while 117 (86%) were not in areas of high disease prevalence. Key drivers were reported for both groups as high workload (41% vs. 29%, P = 0.23) and staffing issues (32% vs. 30%, P = 0.84). Also, work-life balance was reported as a statistically significant driver of burnout (14% vs. 3%, P = 0.02), meaning in areas of high COVID-19 prevalence, burnout rates are higher and work-life balance is negatively affected. In conclusion, Roberts et al. (2020) stated that areas of the United States that did not experience high rates of COVID-19 were less likely to measure burnout in their institutions. A recommendation for future research with a larger sample size to help expound on the effect of the COVID-19 pandemic on burnout among respiratory therapists was made.

Heath et al. (2020) conducted a systematic review of available literature on strategies for minimizing the psychological impact of the COVID-19 pandemic among clinicians and to identify practical all-inclusive approaches that may help healthcare workers address the

current crisis and other challenges that may emerge in the future. Specifically, the review summarized the available management strategies to increase resilience in healthcare workers during the COVID-19 pandemic and beyond. It showed that self-care and organizational justice are key elements for employee well-being and went on to highlight various individual and organizational strategies to that effect. Notably, for self-care it is stated that exercise, sleep hygiene, social support, and relationships are important in relieving stress and preventing burnout. At an organizational level, Heath et al. (2020) asserted that ensuring manageable workloads, providing supervisor support and flexibility to facilitate family-work balance are important factors needed to make physicians feel valued and heard. Also, good communication and supportive professional relationships are important.

Prasad et al. (2021) conducted a survey aiming to understand stress and burnout among healthcare workers in the United States. Between May and October 2020, healthcare workers responded (N = 20,947) from 42 organizations throughout the country. From the data collected, a stress summary score (SSS) was determined and differences from the mean were expressed as Cohen's d Effect Sizes (ESs). Regression analyses were used to test for associations with stress and burnout. The analysis and findings showed that 61% of the respondents expressed fear of exposure or transmission, 38% reported anxiety/depression, 43% reported work overload, and 49% had burnout. Stress scores were highest among nursing assistants, medical assistants, and social workers. In multilevel models, odds of burnout were 40% lower in those feeling valued by their organizations (odds ratio 0.60, 95% CIs [0.58, 0.63], $p < 0.001$). In summary, the data showed that stress is higher among nursing assistants, medical assistants, and social workers, is related to workload and mental health, and is lower when these categories of workers feel valued at their workplaces.

Rodriguez et al. in 2020 published findings of a cross-sectional survey that was conducted to assess burnout levels, home life changes, and measures to alleviate stress of

emergency medicine (EM) physicians during the COVID-19 pandemic. For this study, a cross-sectional e-mail survey was conducted among EM physicians at seven academic emergency departments and 426 (56.7%) EM physicians responded. Validated Perceived stress scale (PSS) and 7-point Likert scale were used and perceptions for stress and burnout were assessed in the key domains such as numbers of suspected COVID-19 patients, levels of home and workplace anxiety, availability of diagnostic testing, severity of burnout, measures to decrease provider anxiety, and changes in home behaviors. On a scale of 1 to 7 (1 = not at all, 4 = somewhat, and 7 = extremely), the reported effect of the pandemic on both work and home stress levels ranged from 4 to 6 with a median of 5. Emotional exhaustion/burnout was reported as having increased from a pre-pandemic median of 3 (2–4) to a median of 4 (3–6) after the pandemic started. The majority of physicians (90.8%) reported change in behavior toward family and friends characterized by a feeling of decreased affection. The most reported strategy for reducing stress/anxiety were increasing offering rapid COVID-19 testing, availability of personal protective equipment (PPE), providing clearer communication about COVID-19 protocol changes, and assuring that physicians can take leave for care of family and self. The authors concluded that the COVID-19 pandemic has caused extensive workplace burnout and as a result, home life and personal lives of EM physicians have been affected, and that availability of PPE, rapid COVID-19 testing, and clear communication about COVID-19 protocol changes are important strategies for alleviating the effects of the pandemic.

Sasangohar et al. in 2020 published an article describing their experience with COVID-19 pandemic and conditions healthcare workers were operating in at the Houston Methodist Hospital (HMH) in Texas. The aim of the observational study was to understand and share experiences of occupational fatigue and burnout suffered by their team of interdisciplinary intensive care unit leadership and collaborating scientists. At the time of the

observation, HMH was caring for about 120 patients who had tested positive for COVID-19 and were receiving treatment in the intensive care units. Important to note is that all the workers were exhausted, and signs of burnout were evident. Sasangohar et al. (2020) noted that several factors may have contributed to the worsened occupational fatigue and burnout in the intensive care units and their lessons learned proved that there were four areas where fundamental changes and adjustments were needed to be able to overcome the excessive fatigue and burnout: (1) national versus locally scaled response plans, (2) occupational hazards preparedness, (3) financial instability, and (4) process inefficiencies. For instance, the lack of established policies for pandemic triage, equipment ordering, and emergency management were key contributors to the increased burden on healthcare workers. Also, there was policy overload because policies that were in use prior to the COVID-19 pandemic suffered overload because each subspecialty (e.g., critical care medicine, anesthesiology, respiratory therapy, nursing, laboratory/pathology, and others), which are usually built basing on guidelines provided by their respective professional societies, became difficult to align with guidelines provided by State and Federal authorities in response to the pandemic. On many occasions, this lack of alignment resulted in teamwork issues, confusion, and frustration among healthcare workers. In conclusion, the authors proposed specific policy recommendations and guidelines for organizational readiness, resilience, and disaster mitigation.

Burnout among healthcare professionals negatively impacts the quality of patient care, leads to reduced professionalism and job satisfaction, and can be very detrimental to professionals' physical and mental health and well-being (Sasangohar et al., 2020). Various categories of healthcare workers in the United States experience varying levels of burnout. The categories of interest for this study are explored in their specialty groupings as physicians, nurses, radiologists, dentists, surgeons, pathologists, laboratory professionals,

anesthesiologists, orthopedic professionals, and pharmacists. As such, it is evident that the effects of burnout among these categories of healthcare workers vary significantly. Also, the level of burnout among different healthcare worker categories in the United States has significantly increased in the recent past due to the outbreak of the COVID-19 pandemic (Rodriguez et al., 2020). There is an urgent need for the U.S. healthcare system leaders to understand the extent of burnout among these categories of workers and to develop strategies that can be applied to reduce or prevent burnout among employees at all levels. Therefore, this paper discusses the extent and effects of burnout on various categories of healthcare workers, the impacts of the COVID-19 pandemic on burnout of various healthcare workers, and the evidence-based strategies that can be applied to reduce burnout among healthcare workers in the United States.

Effects of Burnout on Various Categories of Healthcare Workers in the United States

The first research question asked, "What are the effects of burnout on various categories of healthcare workers in the United States?" Nine of the articles addressed this question (as cited in the subsequent writing of this section). Findings suggest that burnout has far-reaching negative impacts on various categories of healthcare workers in the United States. However, the impacts vary from one category of healthcare worker to the other due to the different roles they play in the healthcare environment and other factors, which include dissimilar wages across various categories of healthcare professionals and different work environments (Putrino et al., 2020).

Nurse burnout prevalence was believed to be around 35% before the COVID-19 pandemic but it is now reported to be 50% compared to physicians where it ranges from 43% to 78% (Reith, 2018). This number is likely to have risen due to the high health demands during the pandemic. Furthermore, burnout negatively impacts nurse job satisfaction due to physical and mental health issues that may arise. Reduced job satisfaction among healthcare

workers due to burnout results from the feeling that professionals are not well appreciated (Sasangohar et al., 2020).

Like nurses and other frontline workers, physicians experience burnout with prevalence ranging from 0% to 80.5% (Rotenstein et al., 2018). In their study, Mangory and Ali (2021) established that physician burnout is significantly responsible for negative patient outcomes. Such adverse outcomes are attributed to reduced aspects of patient care, including reduced communication, less time devoted to service provision, and inadequate competency, and all these being some of the consequences of burnout. One of the impacts of burnout on various categories of healthcare workers is the adverse effect on the quality of services provided. Lee and Mylod (2019) noted that clinicians experiencing burnout are less likely to optimally exploit their potentials, and have a negative impact on their co-workers, which negatively impacts the quality-of-care services they deliver to patients. They further noted that the burnout epidemic, like any other epidemic, will not be overcome by a single magic bullet that cures it, but progress will occur through a multifaceted approach.

The widespread impacts of burnout are relatively similar across all these healthcare categories. Reith (2018) highlighted a 75% overall burnout indicating the severity of healthcare provision and patient outcomes. This is because healthcare workers who experience burnout may develop physical health complications resulting from overworking or exposure to an unhealthy work environment. Ventura et al. (2020) noted that burnout remains one of the leading causes of occupational illnesses among healthcare workers in the United States. Burnout causes many healthcare workers to abandon their work and employment, leading to severe staff shortages. As reported by Rodriguez et al. (2020), many healthcare organizations in the United States cannot effectively retain their healthcare professionals because they readily quit their employment due to burnout. Healthcare organizations experience challenges, including the inability to offer quality healthcare services due to an

inadequate number of healthcare professionals if a large number of staff leave their employment due to burnout (Han et al., 2019). However, it is essential to note that different categories of healthcare professionals experience different levels of burnout.

Impact of COVID-19 on Burnout of Various Healthcare Workers in the U.S.

The second research question asked, "What is the impact of COVID-19 on burnout of various healthcare workers in the United States?" Six of the articles addressed this question (Garcia et al., 2020; Kroft, 2020; Halpern & Tan, 2020; Jha et al., 2020; Restauri & Sheridan, 2020; Roberts et al., 2020). The outbreak of COVID-19 has significantly increased the number of patients that healthcare organizations receive. For physicians and nurses, there has been an increased workload (Roberts et al., 2020). However, most healthcare organizations have not effectively responded to the outbreak of COVID-19 by increasing the number of healthcare professionals to deal with the additional work they have to handle. This situation could put the United States in a position with an unstable frontline healthcare workforce for many years to come, if not addressed with the attention that it deserves (Restauri & Sheridan, 2020).

The effect of burnout on perfusionists, laboratory professionals, pathologists, and radiologists negatively impacts the health and well-being of these professionals (Bui et al., 2011; Garcia et al., 2020; Kroft, 2020). Notably, these professionals are directly exposed to patients with COVID-19 and are at higher risks of infection when handling contaminated samples and individuals. Likewise, Restauri and Sheridan (2020) added that radiologists are likely to suffer from post-traumatic stress disorder amid the COVID-19 pandemic. This is believed to be true because persistent exposure to psychologically traumatic and stressful events can lead to the development of acute stress disorder and potentially post-traumatic stress disorder (PTSD), and this is so because burnout is a syndrome caused by increased exposure to workplace stressors that results in depersonalization, emotional exhaustion, and a

reduced sense of personal accomplishment (Restauri & Sheridan, 2020). Currently, in all healthcare settings, the COVID-19 pandemic has proved to be a perfect cause for chronic workplace stress and burnout that is of great proportion, sufficient to cause traumatic stress in many ways.

Also, few healthcare organizations have increased the payment to healthcare professionals as a result of the additional work due to the increased number of patients received at healthcare organizations following the outbreak of COVID-19. Working under such conditions increases the level of burnout among healthcare professionals working in the U.S. healthcare system today (Halpern & Tan, 2020). In the course of the pandemic, state governments developed robust and aggressive approaches to staffing. For instance, New York, like a few other states, embarked on expanded nationwide recruitment of healthcare workers and even provided financial incentives for them to get on board. This helped provide needed relief, but it is possible that New York resident healthcare workers who held full-time positions could have been demoralized by not getting the financial incentives newcomers were getting.

Non-surgical health providers such as radiologists, dentists, pathologists, and laboratory professionals are also affected due to close contact and handling of contaminated samples and patients. As noted by Jha et al. (2020), a significant number of healthcare professionals have been infected and affected by COVID-19 since its outbreak, which significantly increases burnout among professional healthcare professionals.

Likewise, surgical healthcare providers, including surgeons and anesthesiologists, experience burnout rates of up to 78% due to the high demand for surgery amid increasing infections and transmission risks (Roberts et al., 2020). Worth noting is that orthopedic professionals and pharmacists are equally impacted by issues ranging from infection risk to

insufficient medications for patient treatment. The failure to offer much-needed drugs also takes a toll on pharmacists (Durham et al., 2018).

In conclusion, burnout is a challenge to the U.S. healthcare system that must be addressed to ensure that healthcare organizations achieve their goals and objectives. Burnout negatively impacts the quality of care given to patients, which negatively impacts their treatment experience and outcomes. The outbreak of COVID-19 has significantly increased the level of burnout among healthcare workers due to the additional work and risks that the disease exposes them to (Robertson et al., 2020). As such, there is a need for the U.S. healthcare system to adopt evidence-based strategies aimed at reducing burnout among healthcare workers. Some of the evidence-based strategies that can be applied to reduce burnout among healthcare workers in the United States include the employment of more healthcare professionals, encouraging team-based care, involving the healthcare professionals in the process of scheduling, implementation of support programs, and provision of additional training and education to healthcare professionals.

Evidence-Based Strategies Applied to Reduce Burnout among Healthcare Workers in the United States

The third research question asked, "What are the strategies applied to reduce burnout among healthcare workers in the United States?" Twelve of the articles addressed this question (as cited in this section). Evidence-based practice is currently the desired standard in various settings of the United States' healthcare system. By definition, evidence-based practice refers to an approach to delivering healthcare services that aim to find a solution to an issue by integrating the best available evidence from patient care data and studies while taking into account the values and preferences of all patients (Hilton, 2017). Evidence-based practice requires that an issue be identified and research that has been proven and tested be used to address the problem and ensure improved patient care and outcomes (Hilton, 2017).

Concerning the issue of burnout among healthcare workers in the United States, there are a host of evidence-based strategies that are increasingly being applied to effectively and successfully address it (He et al., 2020).

According to Kancherla et al. (2020), one of the evidence-based strategies applied to reduce burnout among healthcare workers in the United States is to ensure there is an adequate nurse-to-patient ratio. Research has shown a direct relationship between nurse-to-patient ratios and the rates of burnout among healthcare workers (McHugh et al., 2011). Kroft (2020) found that workplaces with high workloads and limited resources are associated with a large number of their employees being burnt out, and job dissatisfaction is high among them, therefore supporting use of lower nurse-patient ratios to improve burnout. This is in line with an earlier study among nurses that found that healthcare settings with 9:1 patient-to-nurse ratios are highly likely to display increased levels of emotional and physical exhaustion compared to those with 4:1 ratios (McHugh et al., 2011). According to this study, an increase in the number of patients increases the risk of burnout among healthcare professionals by over 20%. Healthcare organizations in the United States are reducing burnout by bringing in extra staff, allowing them to address other challenges like poor patient satisfaction, readmission rates, nurse turnover, and poor patient outcomes (Roberts et al., 2020).

Another evidence-based strategy applied to reduce burnout among healthcare workers in the United States entails encouraging team-based care (Helfrich et al., 2014). There is growing recognition and appreciation of the critical role played by team-based care in reducing burnout among healthcare professionals. Research shows that team-based care is associated with reduced levels of burnout (Reith, 2018). In addition, studies have shown that team-based healthcare is linked to enhanced patient outcomes and may also be a technique to enhance the well-being of healthcare professionals (Helfrich et al., 2014). According to Reith (2018), healthcare facilities in the United States are increasingly implementing team-based

care to reduce burnout while improving both team and patient care delivery experience. It is evident from the findings of Kroft (2020) that various upcoming value-based payment systems in the United States enable closer alignment and integration of healthcare team members by using well-organized payments and responsible care.

Furthermore, burnout among healthcare workers in the United States is reduced by addressing the process rather than the metrics. According to Marchalik and Shanafelt (2020), healthcare organizations in the United States have realized that no burnout or well-being metric effectively addresses the issue of burnout. Most organizations currently address burnout by encouraging authentic reports among healthcare professionals (Roberts et al., 2020). Research has found out that accurate reporting among healthcare workers addresses the issue of burnout by aiding in the identification of areas that require urgent intervention within the healthcare system (Marchalik & Shanafelt, 2020). This evidence-based strategy involves the overall transformation of the healthcare systems to reduce burnout among healthcare workers. In particular, healthcare organizations are implementing programs that focus on ensuring the successful implementation of process enhancement measures instead of achieving a given ranking or threshold score. An example of such a program is the Joy in Medicine Recognition Program, which has effectively addressed burnout by paying attention to the process but not the outcome (Marchalik & Shanafelt, 2020). Notably, this strategy underscores the need to ensure that environment promotes the well-being of healthcare workers, teamwork, leadership, the efficiency of practice, and support.

Involving healthcare professionals in scheduling is yet another evidence-based strategy applied to reduce burnout among healthcare workers in the United States. More often than not, healthcare workers, more so nurses, are scheduled for several days in a row, resulting in increased exhaustion levels. According to Grace and VanHeuvelen (2019), the issue of burnout is usually further compounded by the inability of healthcare organizations to

allow healthcare workers to have more control of their schedules. Hospitals in the United States are increasingly recognizing the importance of involving healthcare workers in scheduling. Studies have shown that nurses often have an improved work-life balance if they can take an active role in their shift scheduling. Healthcare organizations are currently addressing this issue by having healthcare professionals work with their organizational managers and staffing offices to develop schedules that work for all of them.

Another evidence-based strategy applied to reduce burnout among healthcare workers in the United States is implementing support programs. The healthcare profession is one of the most stressful and constantly evolving professions. U.S.-based healthcare organizations are helping their healthcare workers cope with work-related stress and pressures by implementing wellness and support programs (Putrino et al., 2020). These programs range from those aimed at educating healthcare professionals about proper break scheduling to those that aim at improving their overall health and developing comfortable respite areas (Heath et al., 2020).

Furthermore, studies have shown that burnout among healthcare workers can be effectively reduced by encouraging service for others (Jindal, 2020). According to Jindal (2020), this strategy entails encouraging compassionate care. This strategy reduces burnout among healthcare professionals by ensuring that the needs of all patients are met while increasing healthcare professionals' satisfaction levels by bringing personal joy.

Chapter 5: Discussion

This systematic review was aimed to present a comprehensive picture of the prevalence of burnout and its effects among various healthcare workers before and during the COVID-19 pandemic, and to explore evidence-based strategies that can be applied to reduce or prevent burnout.

From the results of this literature review, findings suggest both nurses and physicians experienced an increase in work stress due to a high influx of patients, leading to higher burnout rates as compared to the time before COVID-19 pandemic started. Emergency response personnel had the least pre-COVID-19 workload stress and burnout possibly because there were fewer patients in need of emergency medicine services, and this was a good reason for increased mindfulness and reduced medical errors; but the onset of the COVID-19 pandemic changed the status quo (Gomez et al., 2020). This is so because patient numbers increased and this led to an increase in workload in all departments of healthcare facilities (Prasad et al., 2021). Also, the rise in COVID-19 cases made balancing work demands and family responsibilities challenging. Ross (2020) and Heath et al. (2020) agreed that COVID-19 led to an increase in demand for medical services, and decreased commitment to the workplace. This aspect increased stress since nurses and physicians had to attend to family needs irrespective of the workplace workload (Liang et al., 2020; Ross, 2020). Also, getting involved in other roles and duties that are non-clinical—such as managing communication and service delivery technologies, and attempts to save time, contributed 21.36% burnout in nurses, 19.20% in physicians, and 18.42% of cases of burnout among primary care physicians (Liang et al., 2020).

Physicians experienced burnout due to their administrative demands (Shreffler et al., 2020). The high patient turnout during COVID-19 mandated them to take more administrative and patient case management roles, leading to emotional and physical

exhaustion, manifesting as stress and fatigue (Shreffler et al., 2020). Anxiety was associated with more workload beyond one's training, with practicing healthcare workers experiencing more burnout (Miller et al., 2021). Among respiratory therapists, 32% of burnout cases were caused by a high workload, while 30% of burnout cases were caused by understaffing (Ross, 2020). Similarly, Franza et al. (2020) and Miller et al. (2021) established that difficulties in work-life balance increased respiratory therapists' susceptibility to burnout. Ross (2020) and Shanafelt et al. (2020) substantiated that respiratory therapists' burnout increased since their services were more critical in responding to COVID-19 cases. Notably, COVID-19 is a respiratory infection (Shanafelt et al., 2020). Therefore, healthcare professionals with experience handling respiration complications are the lead interventionists in associated cases (Shanafelt et al., 2020).

The lack of personal protective equipment and balancing between routine domestic chores and workplace assignments were the primary stressors (Shah et al., 2020). This is so because lack of PPE among healthcare workers caused fear of contracting COVID-19 infection and reluctance in accepting patient care tasks and executing them effectively (Miller et al., 2021).

The findings reveal that burnout cases have become more evident during the pandemic. The outcomes are similar to findings in Indian hospitals where Khasne et al. (2020) substantiated that burnout cases increased during the pandemic and surpassed the cases recorded during typical hospital situations and that physicians were 1.64 times more likely to experience pandemic-related burnout than the administrative staff.

Globally, the Center for Infectious Disease Research and Policy (2020) report indicated that more than 8.5 million cases of COVID-19 were reported by June 25, 2020, reflecting an increased hospital workload. Around that time of the year, the United States had registered 4,843,293 cases of COVID-19 and 24,254 of them were actively being cared for in

hospital intensive care units (Arentz et al., 2020). On the other hand, Jung et al. (2020) found that the number of deaths recorded had reached 457,000 due to the lack of definitive treatment. Comprehensive treatment during the pandemic was hampered by an increased workload, making it difficult for physicians and nurses to attend to a single patient conclusively. A high workload contributed to increased medical errors due to overlooking procedures to save time for attending to more patients (Kroft, 2020). In addition, the hospital demands following a surge in COVID-19 cases made it difficult for both nurses and physicians to attend to accomplish their tasks and domestic chores, leading to depersonalization and low self-accomplishment.

According to Gomez et al. (2020) and Abraham et al. (2020), burnout has increased over the last three decades. From job demands-resources theory, burnout results from high workplace demand with limited resources (Biggs et al., 2014). Scarce resources lead to employee struggle to meet workplace demands, leading to burnout and emotional and physical exhaustion. However, the assertion is contrary to the study findings showing that well-resourced U.S. healthcare facilities reported high burnout rates due to a high influx of patients. Roberts et al. (2020) reiterated that the COVID-19 pandemic led to an increase in demand for healthcare services, leading to a rise in hospital workload. According to Roberts et al. (2020) and Lai et al. (2020), the causes of burnout during the COVID-19 pandemic included the anxiety of being infected due to increased viral load, prolonged work hours, and exposure to discourses that may devalue the services provided by healthcare workers. This observation further affirms the theoretical assertion of the job demands-resources theory as found in line with the finding by Ross (2020), Franza et al. (2020), and Miller et al. (2021), who established that understaffing and lack of advanced COVID-19 screening technologies increased burnout due to employee strain to meet workplace demands regardless.

Conclusion

Overall, cases of burnout among healthcare professionals increased during the COVID-19 pandemic. The rise in burnout is linked to increased workload following a high demand for care services by COVID-19 patients. A surge in cases of COVID-19 infections directly translates to high patient-healthcare worker engagement and this has been proven to have a negative bearing on healthcare workers' effectiveness and well-being.

Burnout causes many healthcare workers to abandon their work and employment, mostly so due to anxiety and fears of contracting COVID-19, as well as to lack of reliable protective equipment, leading to severe staff shortages. As reported by Rodriguez et al. (2020), many healthcare organizations in the United States cannot effectively retain their healthcare professionals because they readily quit their employment due to burnout. Those who have signs of burnout but still work are faced with challenges of diminished interest in their work, are less productive and prone to making errors, and collectively these are grounds for poor service delivery and harm to patients. It is also important to note that different categories of healthcare professionals experience different levels of burnout.

To address burnout and its effects and impacts among healthcare workers in the United States, many evidence-based strategies are increasingly being applied. Evidence-based practice requires that an issue be identified and research that has been proven and tested be used to address the problem and ensure improved patient care and outcomes.

Limitations and Recommendations

Healthcare institutions, in collaboration with the U.S. government, need to identify ways to decrease workloads during critical situations like the COVID-19 pandemic. Establishing strategic measures to reduce daily workload in healthcare facilities can help minimize stress and strain on healthcare professionals, thus reducing burnout and improving

their overall quality of life. For example, the division of labor as a workload breakdown might be implemented to avoid overworking healthcare workers.

Understaffing and under-resourcing as well emerged as significant factors of burnout. Hence, hospitals should be adequately staffed and resourced. For instance, for nurses, achieving a high nurse-to-patient ratio is desirable in reducing the workload, and the same principle holds true for healthcare professionals in all the clinical and allied professionals' departments. This will help to reduce the risks of burnout and medical errors.

Emergency units and general ward settings were associated with a high prevalence of burnout because of increased workload due to a surge in COVID-19 cases. Also, healthcare professionals in these healthcare work settings exhibited anxiety due to fear of contracting COVID-19infection . Following the findings, hospitals should ensure adequate staffing and provide safety equipment to emergency and general ward medical professionals to minimize their vulnerability to stress and burnout.

The current study was based on secondary research. Therefore, it did not provide a practical perspective of COVID-19 and its contribution to burnout. Future studies should involve collecting primary data to establish the impact of COVID-19 on burnout among healthcare professionals in the United States. Also, this review found that some of the studies lacked robust designs and standardized instruments, and this further affirms the need for a well-designed longitudinal study spanning from pre-COVID-19 to post-COVID-19 to establish the trends in COVID-19 and risks of burnout. Comparing the outcomes with those from other countries might be essential in future studies to validate the findings for generalization and use in global perspectives.

General ward nurses and critical care unit healthcare workers experienced more burnout compared to healthcare workers in other settings. Lack of safety equipment and increased workload contributed to increased emotional and physical exhaustion, hence high

burnout rates. Balancing between domestic and workplace responsibilities and inadequate coping skills increased risks of burnout. Notably, practicing healthcare students experienced more burnout than permanent healthcare workers who have served for an extended period. Therefore, there is an urgent need for strategic intervention in cases of burnout by healthcare institutions and the U.S. government. Training and education on coping with stressful and strenuous tasks may be necessary to minimize burnout. The suggestions can be implemented as strategic contingency measures for resilience against adverse outcomes of pandemics or other detrimental healthcare situations.

Like it is for other healthcare specialties affected by burnout, creating targeted interventions may help reduce burnout or curtail its effects and improve the quality of well-being for laboratory professionals, improve their morale, and alleviate the recruitment and retention challenges laboratory departments face. This may be complemented by a comprehensive wellness program developed and supported at the institutional, local, and national levels.

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Appendix A: Data Extraction and Synthesis Table (Matrix Table)

Author/Date	Study Design/Methods	Sample	Job Demand and Resources	Healthcare worker Category	Prevalence of burnout	Results/Conclusion	Interventions/Strategies
Abraham, C et al; 2020	Systematic review	Primary care providers (N =22)	Increased workload	Physicians (Primary care providers)	13.5% to 60%	interventions to improve the practice environment are needed to help reduce PCP burnout	Institutions are encouraged to apply robust study designs and standardized instruments to consistently measure burnout
Jha et al; 2020	Survey	Interventional Pain Physicians (N =100)	Limited resources	Interventional Pain Physician	78%		Interventional pain physicians throughout the United States are experiencing a considerable level of burnout associated with noticeable logistical shortages and psychological stress
Bui, J et al; 2011	Survey	Perfusionist (N = 336	Workload, long working hours	Perfusionists	17.6%	High-stress level, work, and personal conflict	Leaders should encourage healthy interpersonal relationships amongst co-workers
Demirjian, N et al; 2020	Survey	Radiologist (N = 689)	Practicing in environments with limited supplies, heavy workloads	Radiologists	61%	the stressor of "personal health" was a strong predictor of higher anxiety scores	Significant attention should be paid to how we continue to support radiologists working in drastically altered practice environments and in remote settings

							where resources are limited
Durham, M. et al. (2018)	Cross-sectional survey	Pharmacists	Pharmacists (N= 371)	Heavey workload, limited resources	53.2%	Factors contributing to pharmacist burnout in this setting include high census numbers and low pharmacist-to-patient ratios	Absence or unawareness of available resources was significantly associated with pharmacist burnout
Garcia, E et al; 2020	cross-sectional survey	Medical laboratory professional (N = 4,613)	Heavy workload, limited resources	Medical laboratory professional	78.3 - 85.3% have experienced it before. 55% have it currently	Burnout in laboratory professionals is higher than originally thought	Institutions should develop comprehensive wellness programs that address the physical, mental and emotional well-being of laboratory professionals
Gomez, S et al., 2020	cross-sectional survey	Critical care professionals (N =481)	,,	Critical care professionals	42 -55%	A call for organizations to implement the National Academy of Medicine's (NAM) recommendations for Clinician Well-Being	Need for organizations to conduct longitudinal studies to assess the long-term impact of COVID-19
Grace, M. & VanHeuvelen, J.; (2019)	Survey	physicians, nurses, and respiratory therapists (N =222)	heavy work pressure	physicians, nurses, and respiratory therapist		Higher status healthcare workers (physicians and nurse practitioner	The findings of this study provide insights into the job demands and mental health issues confronted by today's

						s) are more likely than their colleagues to report heavy work pressure, work-life conflict and irregular work hours	medical workforce
Han, S., et al; 2019	Cost-consequence analysis using a mathematical model	Physicians (N = 6880)		Physicians		Approximately $4.6 billion a year is related to physician turnover and reduced productivity which is attributable to burnout in the United States	At the organizational level, the average annual cost attributable to burnout was estimated at $7600 per physician. These costs ranged from a minimum of $4100 to a maximum of $10 200 per physician
Heath, C et al., 2020	Systematic review	Clinicians	individual and organizational resources constrained by excessive workload	Clinicians		Reallocating how revenue is distributed throughout the organization, mindfulness interventions, and staff feedback sessions	Selfcare, Organizational justice interventions against burnout during COVID-19 pandemic

He, K., Stolarski, A; 2020	Qualitative survey	General Surgery residents (N =30)	Increased workload and limited staffing	Surgery residents		Fear of exposing the family to fCOVID-19 (80%)	Surgery departments should support their trainees during all phases of emergency response
Helfrich, C et al; 2014	cross-sectional survey	VA primary care personnel (N= 4,539)	High workload, lack of social support, inadequate staff training	Primary care physicians	39%	Emphasizing participatory decision making, and encouraging teamwork spirit improves competency	Appropriately staffed medical home-based medical models lower burnout
Hilton, T. (2017).	cross-sectional survey	Medical Laboratory professionals (N = 184)		Medical Laboratory professionals	All participants reported burnout score ($\geq$3.0) where $\leq$2.0 is considered low and $\geq$3.0 is considered high	There were significant predictive relationships between all three domains of MBI measure of burnout (emotional exhaustion, cynicism, and professional efficacy) and turnover intention	Emotional exhaustion and professional efficacy are the best predictors of turnover intention
Kroft, S. et al; 2020	Survey	Pathologist and Laboratory professionals	High and complex workload and limited support resources	Pathologist and Laboratory professionals	71% of pathologists have felt it	Burnout and job stress is high among pathologist	Future longitudinal studies to get a better understanding of burnout causation

					46% have it. 84.1%laboratory professionals have felt it, 50% have it	and clinical laboratory professions	and outcomes would be of great significance.
McHugh, M et al; 2011	cross-sectional survey	Registered nurses (N = 68,724)	Uncontrolled workload, staff remuneration deficiencies, and lack of supervisor support	Nurses	34% of hospital nurses and 37% of nursing home nurses	Dissatisfaction and burnout among nurses lead to low patient satisfaction	Dissatisfaction among nurses is dangerous for patients unprofitable for health care employers
Prasad, K., McLoughlin, et al., 2021	Survey	National survey (N = 20,947)	High workload	Various groups of healthcare workers	49.3 – 60.7%	Fear of exposure to and transmission of COVID-19, mental health concerns, and work overload were associated with stress and burnout, while a sense of feeling valued was associated with improved outcomes	Understanding mediators of stress and burnout and the potential mitigator of feeling valued may allow organizations to address these work-life factors and cultivate wellness among their healthcare workers

Reith, T. et al., 2018	Narrative review	Physicians and nurses	Stressful long working hours and limited self-care resources in hospitals and clinics	Physicians and nurses	51- 78% physicians 49% nurses	If not addressed, the burnout epidemic may continue to worsen, to the detriment of patients and physicians alike	Organizations should provide resources encouraging individual physicians to practice self-care at the hospitals or clinics, and may facilitate memberships to local gyms
Roberts, K et al; 2020	survey	Respiratory Therapists (N = 164)	High workload and understaffing (decreased human resource)	Respiratory Therapists	>40% burnout rate in all states	States with a high COVID-19 incidence report more cases of burnout compared to states reporting low COVID-19 cases.	COVID-19 hotspots need adequate staffing and resourcing to minimize risks of burnout.
Rodriguez, R et al; 2020	Cross-sectional survey	Emergency Department Physicians (426)	Excessive workload and limited logistical supplies	Physicians		Emergency care physicians are more susceptible to burnout due to a high workload and limited PPE supply during the COVID-19pandemic.	• Critical care physicians need support to help them cope with stress and burnout. • Institutional measures, including enhanced availability of PPE, rapid turnaround laboratory testing, and clear communication protocol changes should be enacted to mitigate physician stress

Sasangohar F. et al., 2020	Observational	ICU Physicians (n= 120)	Increased workload and straining logistical supply system	Physicians		lack of established policies for pandemic triage, equipment ordering, and emergency management has led to system-wide inefficiencies and this has increased the burden on health care workers	Lack of preparedness and insufficient training of staff contributed to burnout
Shanafelt T et al; 2012	Survey	Physicians (N = 7288)	Long hours worked per week,	Physicians	45.8%	physicians were at higher risk for emotional exhaustion depersonalization	Physicians working in frontlines of care are more prone to burnout than other physicians' specialties. Physicians are more at risk of burnout than other healthcare workers in the US.