

AMERICAN UNIVERSITY OF BEIRUT

WORKERS' WELLBEING DURING THE COVID-19
PANDEMIC: A SCOPING REVIEW

by
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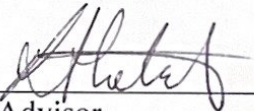
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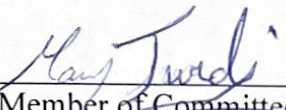
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ABSTRACT OF THE THESIS OF

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The emergence of SARS-CoV-2 in December 2019 marked the onset of the COVID-19 pandemic, leading to widespread global health crises and necessitating unprecedented measures, including lockdowns and restrictions. This paper presents a scoping review of the literature to explore the multifaceted impact of the pandemic on workers' wellbeing.

To explore this topic, a scoping review was conducted. The study adhered to the JBI and PRIMSA Extension for Scoping Review Framework. An inclusive search strategy to identify all articles that investigated mental health and wellbeing was initially carried out. The searches identified 6,952 papers, with 1,091 duplicates removed. After title and abstract screening based on predefined criteria, 2,237 articles were excluded. The remaining 3,624 underwent full-text screening, leading to the exclusion of 3,128 articles. Ultimately, 496 articles were included, and a focused analysis on a subset of 25 articles addressing wellbeing outcomes among workers during the COVID-19 pandemic will be presented in this review.

With a global perspective, the study reveals diverse contributions, including 32% of studies originating from the United States, and notable concentrations in Italy (12%) and the UK (12%). Healthcare workers (HCWs) constitute 84% of the professions studied, with nurses (40%) and doctors/physicians/advanced practice providers (36%) being prominent. The methodologies employed encompass a cross-sectional study design and online self-administered questionnaires in all articles. The majority of participants are female (72%), and journal quartiles indicate 64% in Q1. Wellbeing measurement tools, predominantly the WHO wellbeing index (WHO-5), and online self-administered questionnaires are consistently utilized.

In light of the findings, this study provides recommendations to address gaps in the existing research. Longitudinal studies are crucial to capture the evolving nature of these impacts over time. Additionally, expanding the scope of participant representation can advance the understanding of the complex psychological challenges faced by workers during the pandemic.

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CHAPTER I

INTRODUCTION

A. The COVID-19 Pandemic and Its Impact on Wellbeing

In December 2019, the first case of SARS-COV-2 – known as COVID-19 was recorded in Wuhan, China and by October 21, 2022, the number of confirmed COVID-9 cases had exceeded 623 million worldwide, as reported by the World Health Organization (WHO) (WHO, 2022c). Consequently, various countries implemented widespread lockdowns and precautionary measures, which in turn adversely impacted the populations' health and quality of life, exacerbated pre-existing health conditions, and disrupted people's daily lives. These disruptions had a significant impact on various aspects of people's lives, particularly in their workplace. Consequently, workers were faced with new challenges including temporary unemployment, reduced working hours, working from home, home schooling for children, and others (WHO, 2022a). These challenges and changes furthered the burdens faced by workers thus leading to negative consequences on their mental health and wellbeing (WHO, 2022a).

Additionally, workplace interactions with others and the ability to share common areas and breaks usually create a more enjoyable environment (Kohll, 2019). However, due to the pandemic, several restrictions were implemented in the workplace affecting workers' mental health, including remote work, limited movement and interaction in the workplace, implementing several shifts during the day to reduce contact between employees, and others (Liu, Xu, & Ma, 2021; ISO, 2022). Additionally, individuals were reported to be reluctant to disclose their mental health struggles during the pandemic due to fear of stigmatization, the feeling of helplessness, and their responsibilities to the

community, further exacerbating the adverse impact on mental health and wellbeing outcomes (Galbraith et al., 2020; Spoorthy, Pratapa, & Mahant, 2020).

The literature has reported several negative impacts on workers' mental health and wellbeing including increased anxiety, insomnia, burnout, depression, post-traumatic stress disorder (PTSD), stress, frustration, fear, helplessness, among others (Abdulla et al., 2021; Annaloro et al., 2021; Giorgi et al., 2020; Hamouche, 2020).

Mental health and wellbeing outcomes were reported to differ between different fields of work and different working positions as each position entails distinct tasks, responsibilities, and mental strain (Elhadi et al., 2020; Evanoff et al., 2020; Miguel-Puga et al., 2021). For example, frontline workers who were dedicated to combating the COVID-19 pandemic and who had an increased risk of contracting the virus due to the nature of their work were among the occupations whose mental health suffered greatly because of the pandemic (Cullen, Gulati, & Kelly, 2020). As such, a large body of literature is dedicated to exploring the impact of the pandemic on mental health and wellbeing of frontline workers, including healthcare workers, emergency medical service professions, and others.

The literature has also identified various factors that act as protective factors or risk factors that exacerbate mental health and wellbeing outcomes among workers, such as demographic factors, social factors, and economic factors. Some of the risk factors relating to workplace or personal factors include gender, age, previous mental disorders, field of work, seniority at work, extensions of working hours, and availability of the necessary support groups and personal protective equipment (PPE) (Abdulla et al., 2021). The mental health and wellbeing of workers were also impacted by the workplace's adherence to safety and public health measures. Various workplaces/organizations dealt

with the situation differently ranging from completely disregarding safety regulations to implementing them strictly. Among those that implemented rigorously the safety measures, they took the necessary measures to ensure optimal working conditions amidst the pandemic by providing the necessary PPE and adoption of remote working (Lazaro-Perez et al., 2020; Sinclair et al., 2021). Conversely, some organizations adopted a strict approach, ignoring all public health measures and going so far as to threaten or terminate individuals for wearing masks in the workplace (Sinclair et al., 2021).

B. Thesis Objectives

The objective of this thesis is to map the available literature on the impact of the COVID-19 pandemic on the wellbeing of workers. A scoping review was conducted to address this objective.

CHAPTER II

METHODOLOGY

A. Concepts & Measurements

The following concepts and definitions are used in this thesis:

A. Wellbeing is defined as “a positive outcome that is meaningful for people and for many sectors of society, because it tells us that people perceive that their lives are going well. Wellbeing generally includes global judgments of life satisfaction and feelings ranging from depression to joy” (CDC, 2022).

B. Healthcare workers are defined as “anyone who works in a healthcare or social care setting, including healthcare & care students on clinical placement, frontline healthcare & care workers and other healthcare or care workers not in direct patient contact” (HPSC, 2023).

B. Study Design

In order to achieve the previously mentioned objective, a scoping review of peer-reviewed articles was conducted. All those who participated in the screening and data abstraction process were either students or alumni of the American University of Beirut.

C. Protocol

The protocol of the review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Extension for Scoping Reviews (Tricco et al 2018).

D. Eligibility Criteria

The eligibility criteria were developed prior to the search strategy following the Joanna Briggs Institute (JBI) Population /Concept/Context (PCC) Framework (Pollock et al., 2023) as follows:

1. The study population includes all workers from all occupations regardless of their job position.
2. The main concept being studied in this scoping review is mental health and wellbeing.
3. The study context is during the COVID-19 pandemic.

Qualitative articles and reviews of articles were excluded to ensure consistency in the data abstraction process. In addition, only articles in English language were included in this review.

E. Information Sources and Literature Review

A comprehensive search strategy was developed with the help of a medical librarian. The strategy included key terms and medical subject headings for the following three concepts (1) workers or workplace, (2) COVID-19 pandemic and (3) mental health and wellbeing. Three electronic databases – Embase, Medline OVID, and CINAHL – were searched on 17 May 2022. Our review identified literature published in all languages and irrespective of their publication dates; however, as COVID-19 was a keyword in the search strategies, the identified studies were published during or after the COVID-19 pandemic – until May 17, 2022). The search strategies for each database are presented in Appendix tables 1,2, and 3.

F. Screening Process

Titles/abstracts and full texts of the identified records were screened using the specific inclusion and exclusion criteria discussed above. Both stages of the screening process were carried out by two reviewers. Any discrepancies that arose during both the full-text screenings were resolved through discussions between the two reviewers, until a consensus was reached. Calibration exercises were conducted prior to the screening process to ensure the validity of the screening.

Given the substantial volume of articles assessing mental health and wellbeing outcomes among workers during the COVID-19 pandemic obtained from the screening process, the focus of this scoping review was narrowed exclusively to the exploration of wellbeing outcomes. This was decided due to the need to streamline the scope of the review and provide a more targeted analysis specifically centered around wellbeing outcomes. By doing so, the review aims to delve deeply into the various factors impacting

the wellbeing of workers during the pandemic, offering a comprehensive understanding of this aspect while maintaining a manageable scope.

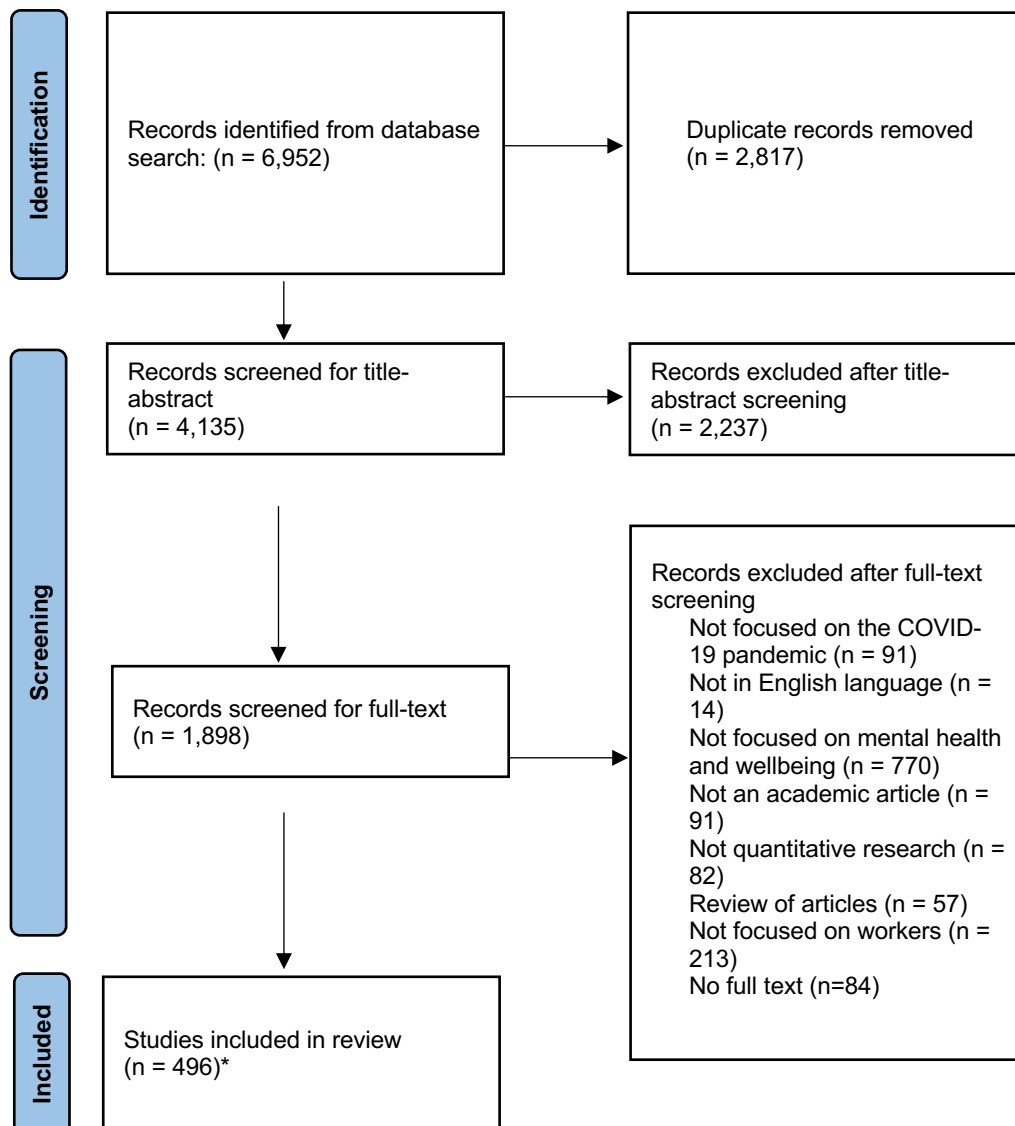
G. Data Abstraction and Synthesis

Data was abstracted from the 25 articles focusing on wellbeing outcomes among workers during the pandemic. The data was extracted using a data abstraction form and included information on study location, study objective, study population, sampling method, sampling size, age and gender of participants, study design, data collection method, types of data analysis, outcomes assessed, and tools used, risk and protective factors, main finding and conclusions, study limitations, and others. The data abstracted were thematically analyzed; risk and protective factors linked to wellbeing outcomes were identified, grouped and analyzed.

CHAPTER III

RESULTS

The initial search process yielded a total of 6,952 articles. After removing duplicates (n=2,817), the remaining 4,135 articles underwent screening based on title and abstract, leading to the exclusion of 2,237 articles based on the predefined eligibility criteria. The final pool of 1,898 articles included in the title and abstract screen phase underwent full-text screening, resulting in the exclusion of 1,402 articles. The full-text screening process results in the inclusion of 496 articles. Out of the total number of articles included a subset of 25 articles focused on wellbeing outcomes among workers during the COVID-19 pandemic. Thus, the findings of this subset of articles will be presented and analyzed in this review.



* 25 articles focusing on wellbeing outcomes will be presented in this review.

Figure 1. Flow diagram on the search strategy results undergoing the screening processes and final numbers.

A. Study Characteristics

Table 1 presents summarizes the main characteristics of the included articles. The majority of the studies (32%) originated from the United States. Additionally, a significant amount of the included articles was focused on the healthcare field with 21 out of 25 articles focusing on this occupation (84%).

Table 1. Summary of data abstraction demographics.

Characteristics	Number of articles	Percentages
Study Location		
Australia	1	4%
China	1	4%
International	1	4%
Ireland	2	8%
Italy	3	12%
Japan	1	4%
New Zealand	1	4%
Oman	1	4%
Saudi Arabia	1	4%
Pakistan	1	4%
Turkey	1	4%
UK	3	12%
US	8	32%
Type of Professions		
HCWs	21	84%
<i>Nurses</i>	10	40%
<i>Doctors/ Physicians/ Advanced practice providers</i>	9	36%
<i>Consultant/ Social workers/ Counselors</i>	3	12%
<i>Resident & Intern</i>	2	8%
<i>Allied health professionals</i>	1	4%
<i>Pharmacists</i>	1	4%
Diverse Workers	4	16%
<i>Cleric work</i>	1	4%
<i>Sales</i>	1	4%
<i>Service workers</i>	1	4%
<i>Professional work</i>	1	4%
<i>Faculty</i>	1	4%
<i>University staff</i>	1	4%
<i>Postdoctoral university fellows</i>	1	4%
<i>Others</i>	4	16%
Sample Size		
Less than 100 participants	2	8%
100 – 500 participants	8	32%
501 – 1000 participants	9	36%
1001 – 1500 participants	1	4%
1501 participants and above	5	20%
Response Rate		
25% and below	5	20%
26% – 49%	6	24%
50% – 74%	5	20%
75% and above	3	12%
Not mentioned	6	24%
Gender of Participants		

Majority Female (more than 50% F)	18	72%
Majority Male (more than 50% M)	4	16%
Equal or Almost Equal (50-50 / 49-51)	1	4%
Not mentioned	2	8%
Journal Quartile		
Q1	16	64%
Q2	7	28%
Q3	2	8%
Q4	0	0%

Table 2 presents the summary of the methodologies and tools employed in the included articles. All of the 25 included articles followed a cross-sectional study design and used an online self-administered questionnaire.

Table 2. Summary of data abstraction methodological results.

Characteristics	Number of articles	Percentages
Tools Used to Measure Wellbeing		
Patient Health Questionnaire (PHQ)	2	8%
Generalized Anxiety Disorder (GAD-7)	2	8%
Wellbeing Inventory	1	4%
Positive Emotions, Engagement, Relationships, Meaning, Accomplishment, Health (PERMAH) Wellbeing Survey	1	4%
WHO wellbeing index (WHO-5)	10	40%
Secure Flourish Index (SFI)	1	4%
Psychological Wellbeing (PWB-S) Scale	1	4%
Warwick-Edinburgh Mental wellbeing Scale (WEMWBS)	1	4%
Linear Analogue Self-Assessment (LASA) scale	1	4%
Third Copenhagen Psychological Risk Assessment Questionnaire (COPSOQ III)	1	4%
Professional Fulfillment Index (PFI)	1	4%
Data Collection Method		
Online Self-Administered Questionnaire	25	100%
Study Design		
Cross-Sectional	25	100%
Sampling Method		
Convenience Sampling	9	36%
Snowball Sampling	1	4%
Cluster Sampling	1	4%
Not mentioned	14	56%

B. Factors Linked to Wellbeing among Workers during the COVID-19 Pandemic

Due to the scarce amount of literature on occupations other than healthcare, the findings and discussion section of this review will concentrate predominantly on the healthcare sector. This is mainly due to the fact that most of the factors are linked to the healthcare profession and patterns and trends were identifiable primarily within the healthcare occupation among the articles reviewed.

The 18 included articles highlighted that the COVID-19 pandemic, an unprecedented global crisis, placed immense burdens on healthcare systems worldwide, subjecting frontline workers to unparalleled challenges and turmoil.

The articles reviewed identified various factors linked to poor wellbeing outcomes among workers during the pandemic, some protective while others are risk factors. Table 3 below presents the factors identified in the review.

Table 3. Risk and protective factors identified in the reviewed articles.

Patterns	Characteristic		Articles	Number of Articles	Percentages
Protective factors		Low educational levels	(de Sio et al., 2021a)	1	4%
		Governmental support and collaborative neighboring practices	(Thompson et al., 2021)	1	4%
		Positive experiences and interactions	(Bhamra, Parmar, & Heinrich, 2021; McLoughlin et al., 2022)	2	8%
		Self-compassion	(Aggar et al., 2022)	1	4%
Risk factors	Work Factors	Lack of experience, working in smaller medical practices, treating vulnerable patient populations, excessive workloads,	(Collins et al., 2022)	1	4%

		time constraints, and COVID-19 challenges			
		Uncertainties about COVID-19, fear of errors, new job allocations	(Moerdler et al., 2022)	1	4%
		Work related stress, workplace violence, high contagion risk at work	(de Sio et al., 2020, de Sio et al., 2021b ; Aggar et al., 2022 ; Slykerman, Li, & Booth, 2022)	4	16%
		Staff redeployment, increased workload, limited PPE access, close contact with patients, fear of infection, lack of emotional support	(Belvins et al., 2022 ; Thompson et al., 2021 ; Dugani et al., 2021)	3	12%
		Low salaries and frequent changes in weekly supervision	(de Sio et al., 2020, de Sio et al., 2021b ; Aggar et al., 2022 ; Slykerman, Li, & Booth, 2022)	4	16%
		Lack of work-life balance	(Abo-Ali et al., 2021 ; Thompson et al., 2021 ; Dugani et al., 2021 ; Yayla & Eskici İlgin, 2021 ; Belvins et al., 2022 ; Platts, Breckon, & Marshall, 2022)	6	24%
		Lack of supervision and support	(Evanoff, 2020)	1	4%
		Changed working hours	(Tomono et al., 2021)	1	4%

	Personal Factors	Having several family members, and home stressors	(Evanoff, 2020)	1	4%
		Limited number of social interactions, and living in a single person household	(Tomono et al., 2021)	1	4%
		Pre-existing mental health conditions	(Platts, Breckon, & Marshall, 2022)	1	4%
		Female gender	(de Sio et al., 2020, de Sio et al., 2021b; Tomono et al., 2021; Aggar et al., 2022; Platts, Breckon, & Marshall, 2022 ; Slykerman, Li, & Booth, 2022)	6	24%
		Low levels of resilience, reduced face-to-face contact	(de Sio et al., 2020, de Sio et al., 2021b; Aggar et al., 2022; Slykerman, Li, & Booth, 2022)	4	16%
		Age of less than 45 years	(Platts, Breckon, & Marshall, 2022)	1	4%

C. Protective Factors

Several protective factors were highlighted in the included studies. For instance, Collins et al. (2022) mentioned that governmental support, collaborative efforts with neighboring practices, and trust in leadership or the organization were common protective factors in his study. These factors fostered psychological safety and emotional support

(Thompson et al., 2021). Moreover, positive experiences and interactions, such as interactions with more experienced practitioners and kinder patients, were identified as protective factors (Bhamra, Parmar, & Heinrich, 2021; McLoughlin et al., 2022). In Australia, self-compassion emerged as another crucial protective factor, showing an association with lower levels of depressive symptoms resulting from pandemic-related stress (Aggar et al., 2022). Finally, lower educational levels were associated with lower mental burdens as these individuals may have been less aware and weary of the weight that the pandemic holds (de Sio et al., 2021a).

D. Risk Factors

1. Work Factors

Risk factors, as identified by Collins et al. (2022), included lack of experience, working in smaller medical practices, and treating vulnerable patient populations, exacerbated by excessive workloads, time constraints, and the challenges posed by the novel virus. This pervasive lack of confidence stemmed from uncertainties and limited information about COVID-19, leading to fears of errors and the impact of new job allocations within healthcare facilities (Moerdler et al., 2022). Furthermore, several risk factors were identified including work-related stress, workplace violence, and an elevated risk of contagion in work environments (de Sio et al., 2020, de Sio et al., 2021b; Aggar et al., 2022; Slykerman, Li, & Booth, 2022). Younger nurses in New Zealand reported higher stress and anxiety, while discrepancies based on gender and age were noted in the effects of the pandemic on healthcare workers in the MENA region (Abo-Ali et al., 2021; Asghar et al., 2021; Badahdah et al., 2021; Slykerman, Li, & Booth, 2022).

A prominent risk factor was trust in leadership emerged as a critical factor, correlating with lower levels and higher distress among healthcare workers. Negative perceptions were influenced by staff redeployment, increased workload, compromised work-life balance, limited access to personal protective equipment, proximity to patients, fear of infection, and a lack of emotional support during the pandemic (Belvins et al., 2022; Thompson et al., 2021; Dugani et al., 2021). Other factors that reduced the trust in leadership included earning lower salaries, experiencing frequent changes in weekly supervision (de Sio et al., 2020, 2021b; Aggar et al., 2022; Slykerman, Li, & Booth, 2022). In Saudi Arabia and Turkey, inadequate management of work-life balance negatively impacted healthcare worker wellbeing (Abo-Ali et al., 2021; Yayla & Eskici İlgin, 2021).

2. Personal Factors

Several personal risk factors have been linked to wellbeing outcomes among workers during the pandemic in the included articles. For instance, having multiple family members in the same household and experiencing home stressors (Evanoff, 2020). Additionally, individuals with pre-existing mental health conditions who are younger than 45 years old are considered at risk (Platts, Breckon, & Marshall, 2022). However, the most notable risk factors appear to be gender-related, particularly for females, coupled with lower levels of resilience and reduced face-to-face contact with loved ones (de Sio et al., 2020, de Sio et al., 2021b; Aggar et al., 2022; Slykerman, Li, & Booth, 2022).

CHAPTER IV

DISCUSSION

A. Protective Factors

The scoping review identified distinct categories of factors impacting the wellbeing of healthcare workers during the COVID-19 pandemic. Protective factors included low educational levels, governmental support, collaborative practices, positive experiences, interactions with experienced practitioners, and self-compassion.

Lower levels of education have been identified as a potential protective factor, suggesting that individuals with reduced educational attainment might be less informed or inclined to engage with pandemic-related information. However, prevailing research, exemplified by Almohammad et al.'s findings in 2021, contradicts this notion. Their study highlights that higher education correlates with more positive attitudes and behaviors, empowering individuals to seek and comprehend information from credible sources, thereby fostering better adherence to preventive measures. Given that the majority of studied populations in existing research were comprised of doctors (36%) and nurses (40%), it may be prudent to reconsider generalizations about healthcare workers' educational levels as there may be an inherent bias in the categorization of lower educational levels as a protective factor. Notably, doctors and nurses, who constitute a significant portion of the studied group, are highly educated professionals. Nevertheless, it is essential to recognize that this study may have referred to specific healthcare professions with "lower educational levels," including consultants, social workers, counselors (12%), as well as residents and interns (8%) . Particularly noteworthy is the

study by de Sio et al. (2021a) in the included articles, the only one that identified this as a risk factor. Notably, this study did not specify the types of HCWs examined.

This scoping review identifies differences in wellbeing outcomes during the COVID-19 pandemic, particularly from one country to another. Additionally, our findings suggest that governmental support is a protective factor for wellbeing outcomes. However, other studies revealed that while in some countries governmental support was found more helpful than in other countries, the pressures and mental burdens were still extremely heavy on the populations. For instance, the US exhibited resilience amidst pandemic challenges, by implementing initiatives like the CARES Act (Donald et al., 2023; Weinstock, 2021). Japan's relief packages buffered its economy, but "soft" lockdowns led to unexpected economic setbacks (Tsigaris, Teixeira da Saliva, & Honma, 2023). Studies highlight workforce distress in both countries due to lack of support and family stressors (Evanoff, 2020), with Japan also impacted by its cultural work ethic (Lincoln & Kalleberg, 1992; Ono, 2018; Tomono et al., 2021). Notably, England's Furlough scheme didn't curb inflation, causing rising unemployment and exacerbating mental health and wellbeing outcomes among workers (Donald et al., 2023).

Collaborative practices among nearby healthcare facilities and engagement with experienced practitioners have emerged as significant protective factors, substantiated by empirical evidence. Jordan, Connors, & Mastalerz (2022) highlighted how such collaboration fosters a sense of community, support, and trust among healthcare providers. Additionally, the exchange of crucial information and emerging data during critical phases notably bolsters preparedness across diverse healthcare scenarios (Bernardo et al., 2021). Moreover, interactions with experienced practitioners provide a

sense of reassurance by offering valuable guidance and insights, facilitating a better understanding of subsequent steps in handling complex situations.

Positive experiences observed among patients, characterized by increased consideration and kindness, potentially stem from their likely adherence to pandemic protocols. This adherence may have cultivated greater appreciation for healthcare workers' efforts, consequently instilling a sense of value and empowerment within the healthcare workforce (Chemali et al., 2022).

Self-compassion emerged as a protective element for the wellbeing of healthcare workers amidst the COVID-19 pandemic owing to its potential influence on mental resilience. Research conducted by Harmanci & Akdeniz (2023) affirmed this assertion, highlighting self-compassion's link to heightened tolerance for uncertainty and diminished depressive or anxious tendencies amid the pandemic. Moreover, the intrinsic traits affiliated with self-compassion are posited to significantly contribute to safeguarding the mental health of healthcare workers during this crisis, underscoring the overarching attributes of self-compassion.

B. Risk Factors

1. Work Factors

Healthcare workers faced multifaceted work-related challenges during the COVID-19 pandemic, identified through various studies. In the United States, the wellbeing outcomes of healthcare workers were intricately linked to specific job roles and workplace locations, wherein trust in leadership emerged as pivotal (i.e., lower trust levels linked to heightened distress, vs. lower distress linked to positive perceptions of leadership) (Moerdler et al., 2022; Thompson et al., 2021). Additionally, lower leadership

roles, particularly among older individuals, exacerbated feelings of lack of control (Platts, Breckon, & Marshall, 2022). Redeployment, increased workloads, compromised work-life balance, inadequate personal protective equipment, patient proximity, and fear of infection were prevalent risk factors impacting healthcare workers (Belvins et al., 2022; Thompson et al., 2021; Dugani et al., 2021). Conversely, in the United Kingdom and Ireland, healthcare workers grappled with sleep deprivation, escalated workloads, and stress stemming from compromised work-life balance and patient interactions (Platts, Breckon, & Marshall, 2022; McLoughlin et al., 2022). In the UK, pre-existing mental health conditions significantly impacted wellbeing, while work-life conflict affected those under 45 (Platts, Breckon, & Marshall, 2022), emphasizing the blurred boundaries between work and home environments. Italian healthcare workers faced heightened stress, violence, and infection risks, disproportionately affecting women and individuals with pre-existing psychiatric conditions (de Sio et al., 2020; de Sio et al., 2021b). Lastly, China witnessed a cascade of workplace violence, discrimination, fear of infection, and threats, contributing to a sense of hopelessness among healthcare workers (Wang et al., 2022).

The disparities in workplace-related risk factors across different countries can be comprehended by examining the unique features of each nation's healthcare system. This can justify the trust, or conversely the lack of trust, in leadership in different hospitals based on their context. A better understanding of the different systems is key to a better understanding of the results of each study. The United States healthcare system, for example, exhibits a bias towards well-insured patients and surgical procedures, placing healthcare workers in urgent services at a distinct disadvantage (Himmelstein & Woolhandler, 2020). Despite the introduction of innovative solutions like telehealth,

responses to the pandemic varied significantly across different US states due to factors such as population density and other contextual variables (Blevins et al., 2022). This can explain the fear of the elevated risk of contagion (de Sio et al., 2020; de Sio et al., 2021b; Aggar et al., 2022; Slykerman, Li, & Booth, 2022) found in the reviews along with the fear of error (Moerdler et al., 2022). The healthcare contexts in countries like the United Kingdom (UK) and Ireland are characterized by distinct national healthcare systems. While the UK's National Health Service (NHS) contends with increased workloads, Irish healthcare workers generally experience better conditions, enjoying higher salaries, improved work-life balance, and greater job security (International Citizen Insurance, 2023c; International Citizen Insurance, 2023b; MedDoc, 2023). Italy, renowned for an accessible healthcare system, faces challenges in catering to population needs while maintaining its global ranking (International Citizen Insurance, 2023a). Similarly, New Zealand and Australia grapple with increased demand and expensive health technologies, impacting healthcare workers (Allianz Care, 2023; DoHAC, 2023; WHO, 2006). This can explain why younger nurses in New Zealand reported high stress and anxiety (Abo-Ali et al., 2021; Asghar et al., 2021; Badahdah et al., 2021; Slykerman, Li, & Booth, 2022). China's subsidized healthcare system prioritizes accessibility but faces considerable workplace challenges (Yi, 2021). In countries like Oman, Saudi Arabia, Pakistan, and Turkey, shortages in staff, regional disparities, and occupational stressors pose significant challenges for healthcare workers (Al-Mahrezi & Al-Kiyumi, 2019; Gurajala, 2023; Muhammad et al., 2023; Özdeniz, 2023).

2. Personal Factors

Throughout the pandemic, personal factors significantly influenced the wellbeing of healthcare workers, as elucidated by various studies. Common risk factors included being female (Belvins et al., 2022), having low resilience levels (Thompson et al., 2021), younger age (Belvins et al., 2022), pre-existing mental health conditions (de Sio et al., 2021b), and poor initial wellbeing (Belvins et al., 2022). Gender and age disparities were conspicuous, with female healthcare workers and younger individuals experiencing more pronounced effects during the pandemic compared to their counterparts (Belvins et al., 2022; de Sio et al., 2021b).

Female workers in the healthcare sector face higher risks of poor wellbeing, largely because women constitute a significant 67% of the healthcare workforce (WHO, 2023). Their vulnerability is compounded by societal roles as primary caregivers for their families, resulting in overwhelming workloads. A study by Liu et al. (2021) highlights that female workers exhibit a substantially higher risk of experiencing conditions like depression, anxiety, PTSD, and insomnia compared to males. These risks have various origins: biologically, hormonal fluctuations and brain responses can sporadically lead to psychological distress in females (Liu et al., 2021). Psychologically, women tend to utilize emotion-focused coping mechanisms during stress (Liu et al., 2021). Furthermore, in a sociological context, women are often expected to provide care for their family members such as their elderly parents and young children, adding to their responsibilities and potential stressors (Liu et al., 2021).

Additionally, low resilience levels pose a risk for healthcare workers as they're closely linked to struggles in managing daily tasks when faced with unexpected events. This is supported by Sakr et al.'s study (2022a), which highlights that strong resilience is

connected to lower anxiety levels among HCWs. Making resilience a priority is important to help healthcare workers to improve their skills in handling crises and reduce future mental health challenges.

Moreover, younger age emerged as a significant risk factor based on the findings of this scoping review. This could be attributed to their limited experience, excessive exposure to distressing news, and a sense of losing out on life's opportunities. This is backed-up by Biber et al. (2022), who highlighted that heightened anxiety among younger adults might be linked to their frequent use of social media and exacerbated economic challenges specific to this age group.

Regarding pre-existing mental health conditions (de Sio et al., 2021b), and poor initial wellbeing (Belvins et al., 2022), the finding may be due to the pandemic's diverse impact on individuals with pre-existing wellbeing concerns, necessitating comprehensive support measures. Accordingly, several articles agree with these findings claiming that strategies to mitigate isolation, ensure healthcare access, and prevent worsened wellbeing are crucial during such pandemics (MacKenzie et al., 2021; Buneviciene et al., 2021; Murphy et al., 2021). In fact, MacKenzie et al. (2021) linked the perception of COVID-19's impact to heightened symptoms among healthcare workers with pre-existing psychiatric conditions. Buneviciene et al. (2021) highlighted that pre-existing health conditions and perceived poor health status increased the risk of reduced wellbeing during the pandemic. Murphy et al. (2021) emphasized COVID-19's effects on individuals with pre-existing conditions, noting increased isolation, limited social connections, and reduced access to healthcare services, potentially exacerbating symptoms and susceptibility to the virus. Addressing these challenges is vital to safeguarding the overall wellbeing of those with pre-existing conditions amid COVID-19.

C. Context Specific Analysis of Results

The visual representation of protective, work risk, and personal risk factors across countries, as depicted in Figures 2, 3, and 4, below, provides a nuanced understanding of the challenges faced by HCWs during the COVID-19 pandemic. The prevalence of these factors varies significantly, shedding light on distinct patterns and potential disparities influencing the wellbeing of HCWs. The legends of the figures symbolize the lowest percentage found in each country to the highest, represented by a color gradient.

Australia and New Zealand emerge as frontrunners in protective factors, with the highest percentages at 53% and 43%, respectively, aligning with the profile of regions generally associated with the global North. Despite having accessible healthcare systems, both New Zealand and Australia grapple with issues such as long waiting lists and heightened demand, impacting the well-being of healthcare workers (Allianz Care, 2023; DoHAC, 2023). Examining work-related risk factors, Australia, Ireland, and the United Kingdom demonstrate lower percentages ranging from 29% to 27%, indicating fewer challenges in the workplace compared to other nations. Across the Atlantic, the UK's National Health Service (NHS) contends with declining performance amid increasing demand, placing a strain on the workload of healthcare staff. Meanwhile, Ireland's focus on accessibility creates a substantial workload for healthcare workers, although it offers better overall job conditions compared to their UK counterparts (International Citizen Insurance, 2023b; International Citizen Insurance, 2023c; MedDoc, 2023). New Zealand, Saudi Arabia, and Turkey share similar percentages, shedding light on commonalities in work-related risks across these countries. In terms of personal risk factors, Australia and New Zealand show lower percentages at 18% and 27%, respectively, suggesting fewer factors contributing to individual risk. In Saudi Arabia, despite providing quality

healthcare through its universal coverage system, there is a need for improvements to achieve a more equitable approach, particularly in addressing staff shortages and regional disparities (Gurajala, 2023). In Turkey, the Health Transformation Program, aimed at improving overall population health, compensates healthcare workers based on workplace challenges; however, rural-urban disparities persist (Özdeniz, 2023).

Representing the global South, Pakistan exhibits the lowest percentage of protective factors at 15%, indicating a comparatively lower prevalence of factors contributing to protection and well-being. Facing a shortage of healthcare workers, Pakistan grapples with a system divided between under-equipped public hospitals and private facilities accessible to a minority (Muhammad et al., 2023). Examining work-related risk factors, China stands out with the highest percentage at 42%, signifying substantial challenges for healthcare workers in the region. China's healthcare system adopts an approach that subsidizes low-income citizens through the Basic Medical Insurance (BMI) system (Yi, 2021).

Italy, Oman, Pakistan, and the United States also face significant work-related challenges, with percentages ranging from 36% to 34%. Turning to personal risk factors, Pakistan leads with the highest percentage at 44%, emphasizing the heightened individual risk faced by healthcare workers in this region. Italy, home to the second-ranked global healthcare system, grapples with the challenge of providing quality care to its entire population (International Citizen Insurance, 2023a). In Oman, the Primary Health Care (PHC) system provides access to a significant portion of the population, but the reluctance of physicians due to limited opportunities results in a burdensome workload (Al-Mahrezi & Al-Kiyumi, 2019). In the U.S., where a bias toward well-insured patients and a focus on surgical procedures intersect with the challenges of the COVID-19 pandemic, frontline

healthcare workers face notable disadvantages (Himmelstein & Woolhandler, 2020; Hassinger, Breuer, & Mishra, 2022).

Distinctive challenges for healthcare workers arise from the diverse healthcare systems worldwide. In this intricate global landscape, the well-being of healthcare workers is shaped by the nuances of each country's healthcare system. The synthesized factors summarized in Table 4, provide a comprehensive overview of a more context specific approach to the findings.

Table 4. Summary of factors affecting wellbeing of HCWs during the COVID-19 pandemic with relevance to the study location.

	Factors	Developing Countries	Developed Countries	References
Protective factors	Educational Levels	-	Contradictory findings	Almohammad et al., 2021
	Governmental Support	Varies among countries	Protective in the US, mixed effectiveness elsewhere	Donald et al., 2023; Weinstock, 2021; Evanoff, 2020; Tsigaris, Teixeira da Saliva, & Honma, 2023; Lincoln & Kalleberg, 1992; Ono, 2018; Tomono et al., 2021
	Collaborative Practices	Collaborative practices beneficial	Beneficial in diverse healthcare scenarios	Jordan, Connors, & Mastalerz, 2022; Bernardo et al., 2021
	Positive Experiences	Increased consideration and kindness	Observed in various countries	Chemali et al., 2022; Bhamra, Parmar, & Heinrich, 2021; McLoughlin et al., 2022
	Self-Compassion	Protective element for mental resilience	Positively linked to mental health outcomes	Harmanci & Akdeniz, 2023; Aggar et al., 2022
Work Risk Factors	Trust in Leadership	Linked to distress in the US, varied elsewhere	Pivotal in the US	Moerdler et al., 2022; Thompson et al., 2021
	Redeployment	Common challenge	Common challenge	Belvins et al., 2022; Collins et al., 2022; Dugani et al., 2021; Moerdler et al., 2022
	Increased Workloads	Common challenge	Common challenge	Belvins et al., 2022; Platts, Breckon, & Marshall, 2022; McLoughlin et al., 2022
	Work-Life Balance	Compromised in the US, stressful in the UK	Varied challenges in different countries	Platts, Breckon, & Marshall, 2022; McLoughlin et al., 2022; Abo-Ali et al., 2021; Thompson et al., 2021; Dugani et al., 2021; Yayla & Eskici İlgin, 2021
	Lack of PPE	Common challenge	Common challenge	Belvins et al., 2022; Thompson et al., 2021

	Patient Proximity	Common challenge	Common challenge	Belvins et al., 2022; Thompson et al., 2021
	Fear of Infection	Common challenge	Common challenge	Belvins et al., 2022; Thompson et al., 2021; de Sio et al., 2020; de Sio et al., 2021b; Wang et al., 2022
	Workplace Violence	Prevalent in China	Varied across countries	Wang et al., 2022
	Discrimination	Prevalent in China	Varied across countries	Wang et al., 2022
	Gender Disparities	Female healthcare workers at higher risk	Risk for females in various countries	Belvins et al., 2022; Liu et al., 2021; de Sio et al., 2020; de Sio et al., 2021b; Tomono et al., 2021; Aggar et al., 2022; Platts, Breckon, & Marshall, 2022 ; Slykerman, Li, & Booth, 2022
Personal Risk Factors	Low Resilience Levels	Linked to struggles in daily tasks	Linked to anxiety among HCWs	Thompson et al., 2021; Sakr et al., 2022a; de Sio et al., 2020; de Sio et al., 2021b; Aggar et al., 2022; Slykerman, Li, & Booth, 2022
	Younger Age	Significant risk factor	Linked to anxiety in younger adults	Belvins et al., 2022; Biber et al., 2022; Platts, Breckon, & Marshall, 2022
	Pre-existing Conditions	Linked to poor wellbeing	Linked to increased symptoms and reduced wellbeing	de Sio et al., 2021b; MacKenzie et al., 2021; Buneviciene et al., 2021; Murphy et al., 2021

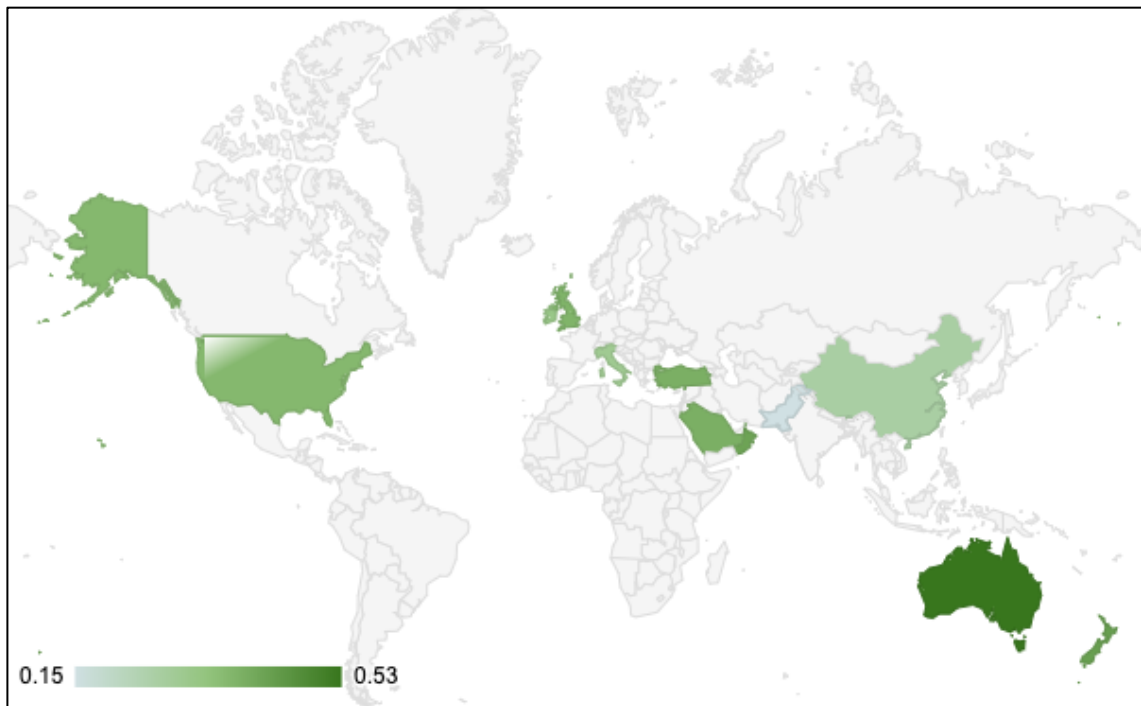


Figure 2. Heatmap summarizing the protective factors per country.

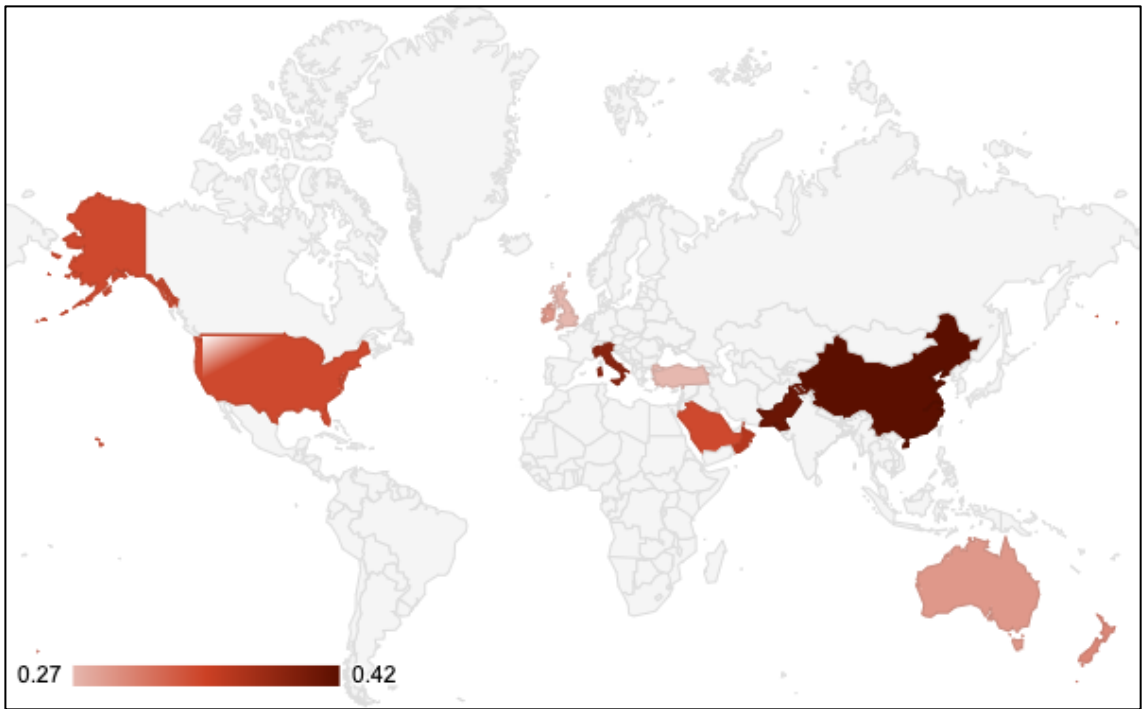


Figure 3. Heatmap summarizing the work risk factors per country.

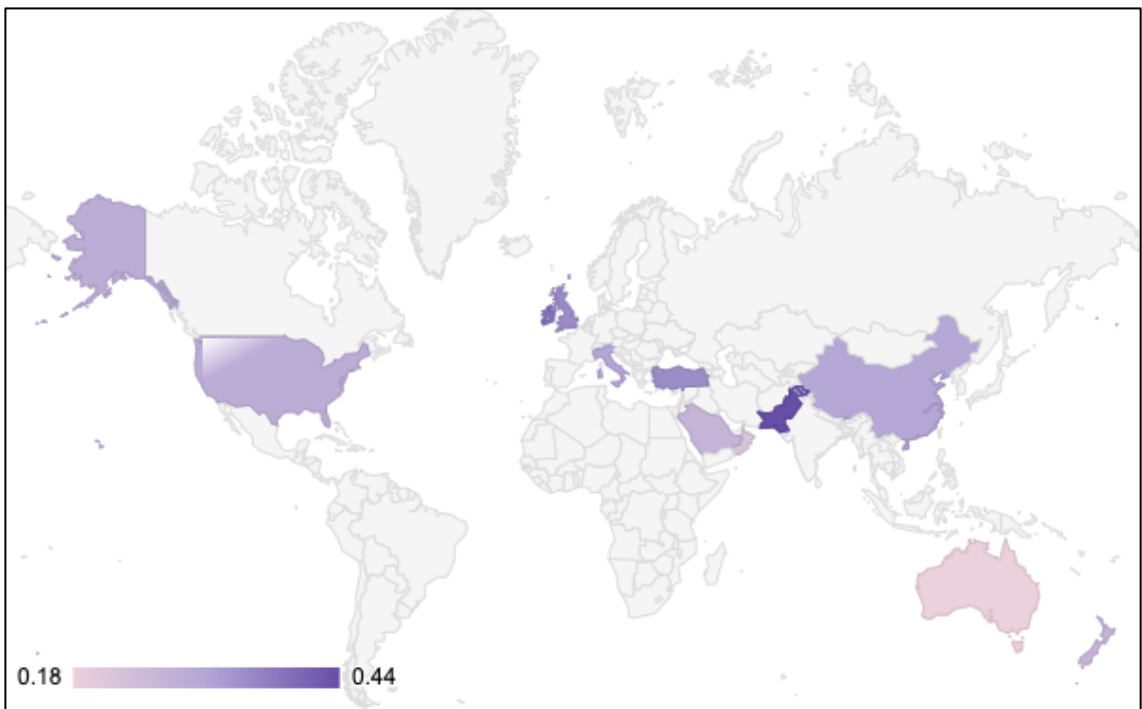


Figure 4. Heatmap summarizing the personal risk factors per country.

D. Literature Gaps

While the data abstracted from the scoped literature covers a large array of factors impacting HCWs' wellbeing, some challenges they generally face were not addressed in the included studies. The studies conducted by Tomo & Simone (2017), Jepkosgei et al. (2022), De Kock et al. (2021), and Johari & Omar (2019), offer a comprehensive understanding of the multifaceted nature of wellbeing within the healthcare sector.

Tomo & Simone (2017) and Jepkosgei et al. (2022) emphasize the importance of intra- and inter-professional relationships, shedding light on the significance of cohesive teamwork and collaboration. These studies underscore the need for nuanced attention to different healthcare professions, particularly nurses, to address specific well-being challenges within the sector. De Kock et al. (2021) extend this exploration into the impact of the COVID-19 pandemic, delving into occupation-specific challenges and the broader systemic response. Johari & Omar (2019) and Jepkosgei et al. (2022) contribute insights into the diverse nature of employment settings, highlighting how varying work contexts shape the psychological wellbeing of healthcare professionals.

The absence of an assessment of the mentioned factors during the COVID-19 pandemic signals a notable gap in the literature.

E. Wellbeing Assessment Scales & Journal Quartiles

Assessing healthcare workers' (HCWs) wellbeing during the COVID-19 pandemic involved a diverse range of scales across studies. The WHO Wellbeing Index (WHO-5) emerged prominently, used in 10 articles, indicating its widespread acceptance in evaluating overall wellbeing. Additionally, the Patient Health Questionnaire (PHQ) and Generalized Anxiety Disorder scale (GAD-7) were used in two articles each to measure

depression and anxiety symptoms among HCWs. Notably, the inclusion of the GAD scale in articles published in Q3 journal (Thompson Munn et al., 2021; Bhamra, Parmar, & Heinrich, 2021) raises questions about the appropriateness of labeling such assessments as measures of wellbeing. This suggests a potential need for more precise terminology and standardized tools for evaluating different aspects of wellbeing, ensuring clarity in the interpretation of results.

Other scales, such as the Wellbeing Inventory, PERMAH Wellbeing Survey, and Psychological Wellbeing Scale, were utilized in individual studies, reflecting efforts to explore varied dimensions of wellbeing, by encompassing positive emotions, relationships, and psychological aspects. Furthermore, the use of scales like Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS), Third Copenhagen Psychological Risk Assessment Questionnaire (COPSOQ III), and others in separate studies provided insights into HCWs' broader wellbeing, including job satisfaction and life contentment. However, the diverse use of scales poses challenges in direct comparison across findings. Standardization of key measurement tools is crucial to enhance coherence in understanding HCWs' wellbeing during the pandemic and to develop targeted support strategies effectively.

Finally, the distribution of studies across journal quartiles reveals interesting patterns in the reported results. Notably, Q1 articles (Aggar et al., 2022; Wang et al., 2022b; McLoughlin et al., 2022; De Sio et al., 2021b; Slykerman, Li, & Booth, 2022; Badahdah et al., 2021; Abo-Ali et al., 2021; Douglas et al., 2022; Moerdler et al., 2022; Blevins et al., 2022; Dugani et al., 2021; Montoya et al., 2021; Moerdler et al., 2021; Margolis et al., 2022) predominantly focus on the psychological impact of the pandemic on healthcare workers. These studies link higher stress levels with specific occupational factors. Q2

articles (Collins et al., 2022; Brady et al., 2021) delve into nuanced differences in wellbeing scores across various countries and professional experiences, highlighting the role of organizational and governmental support in mitigating distress. Simultaneously, Q3 articles (Thompson Munn et al., 2021; Bhamra, Parmar, & Heinrich, 2021) contribute by identifying resilience factors and organizational perceptions significantly influencing healthcare workers' wellbeing.

F. Methodological Limitations of the Included Studies

Caution is necessary in interpreting the findings due to inherent limitations in study design and data collection methods. The majority of the studies reviewed primarily utilize cross-sectional study designs, offering a momentary snapshot of the pandemic's effects, rather than employing longitudinal studies that could provide a more comprehensive understanding of the long-term mental health and wellbeing of workers. Furthermore, it's worth noting that most academic research during the COVID-19 era has predominantly focused on healthcare workers.

Additionally, the reliance on self-administered questionnaires poses limitations in generalizing the data (Margolis et al., 2022; Moerdler et al., 2022 ; Slykerman, Li, & Booth, 2022 ; Wang et al., 2022b; de Sio et al., 2021a de Sio et al., 2021b; Dugani et al., 2021 ; Moerdler et al., 2021; de Sio et al., 2020 ; Evanoff, 2020). Further, the dependence on convenience sampling introduces potential biases such as responder (McLoughlin et al., 2022), recall (McLoughlin et al., 2022; Moerdler et al., 2022; Montoya et al., 2021; Tomono et al., 2021), social desirability (Margolis et al., 2022; Moerdler et al., 2022), volunteer (Collins et al., 2022), and non-response bias (Aggar et al., 2022 ; Moerdler et al., 2022), affecting result representativeness. The studies share limitations related to

study design choices and data collection methods, with web-based techniques used due to pandemic restrictions, potentially introducing biases like selection bias (de Sio et al., 2021a; Douglas et al., 2022; Tomono et al., 2021), survey bias (Platts, Breckon, & Marshall, 2022), and non-response bias (Aggar et al., 2022 ; Moerdler et al., 2022), as well as sampling bias (Platts, Breckon, & Marshall, 2022). Notably, the response rates across the studies vary, ranging from 10.20% to 97.00%. This may be due to the demanding nature of healthcare work during the pandemic or time constraints. Conversely, a higher response rate generally enhances the reliability and generalizability of the study findings, as it indicates a more representative sample of the target population. Studies with lower response rates, such as the one with 10.20% in Brady et al. (2021), may be more susceptible to non-response bias, potentially affecting the external validity and generalizability of the results. On the other hand, studies with higher response rates, like Abo-Ali et al. (2021) with 97.00%, are likely to provide more robust and reliable insights into the experiences and wellbeing of HCWs during the COVID-19 pandemic.

CHAPTER V

CONCLUSION

In the wake of the COVID-19 pandemic, the extensive research conducted on wellbeing has shed light on the factors that have impacted frontline workers and healthcare professionals. This scoping review reveals that the impact of the COVID-19 pandemic on workers' wellbeing is strongly influenced by context-specific factors such as healthcare systems, government support, and cultural norms. Healthcare workers faced challenges like inadequate protective equipment, increased workloads, and strong trust or lack of trust in leadership played a pivotal role in their wellbeing. Gender disparities were evident, with women often experiencing a more significant burden. Maintaining work-life balance was crucial for both healthcare and non-healthcare workers. Access to mental health resources and supportive leadership were vital for mitigating negative effects. Pre-pandemic preparedness emerged as a critical factor, and ongoing data collection and tailored interventions are essential for addressing worker wellbeing effectively.

CHAPTER VI

RECOMMENDATIONS

To address the gaps and limitations in the existing body of research on wellbeing during the COVID-19 pandemic, several key recommendations can be put forth. Firstly, to enhance the robustness and applicability of findings, future studies should adopt a mixed-methods approach, combining quantitative surveys with qualitative interviews or focus groups. This will provide a more nuanced understanding of the complex interplay between various stressors and mental health outcomes.

Additionally, longitudinal studies are imperative to capture the evolving nature of mental health challenges over time. By conducting repeated assessments at different intervals, researchers can identify trends, potential trajectories, and the persistence of certain stressors and outcomes. This approach would also allow for the establishment of causal relationships and a deeper exploration of the long-term psychological and wellbeing consequences of the pandemic.

To counteract potential biases introduced by online surveys and convenience-based sampling, researchers should adopt probability-based sampling methods. This approach will yield a more representative and inclusive sample, allowing for findings to be generalized to broader populations.

Furthermore, efforts should be made to diversify the participant pool beyond the predominant focus on healthcare workers and certain countries. Research in countries that have received limited attention, such as Peru, Moldova, Sri Lanka, Sweden, Switzerland, Tunisia, Austria, Bulgaria, Ecuador, Hong Kong, Kuwait, Lithuania, Libya, Lebanon,

Latvia, and Norway, along with countries that were not researched yet is crucial to capturing the global diversity of experiences.

Moreover, the outcomes derived from this study hold substantial policy implications. They can be instrumental in formulating comprehensive occupational health and safety policies aimed at safeguarding the wellbeing of workers amid the ongoing pandemic. The identification of various risk and protective factors within this scoping review underscores the critical need for a deeper investigation and subsequent development. These factors serve as pivotal points for further research and refinement, contributing significantly to the enhancement of policies designed to protect and support workers.

In conclusion, the synthesis of the available research on wellbeing during the COVID-19 pandemic underscores the pressing need for comprehensive, diverse, and methodologically robust studies. By addressing research gaps and limitations, employing mixed methods approaches, conducting longitudinal studies, and expanding the scope of participant representation, the field can advance our understanding of the complex psychological challenges faced by individuals and communities. Such research is essential not only to inform effective interventions during crises but also to contribute to a broader knowledge base that enhances mental health and wellbeing support systems in the long-term during emergency situations.

CHAPTER VII

STRENGTHS & LIMITATIONS

A. Strengths

This review adhered to the JBI and PRISMA-ScR protocols, ensuring the application of standardized and rigorous review methods. The adoption of this protocol enhances the transparency and reliability of the review process. Additionally, the search strategy encompassed multiple major databases, without imposing restrictions on the year of publication. This approach was employed to broaden the scope of our search and encompass a comprehensive range of relevant articles.

B. Limitations

Similar to other scoping reviews, this study acknowledges certain methodological limitations. Notably, it did not undertake a critical appraisal of the quality of evidence of the included studies. Instead, the review opted for a narrative approach, providing a descriptive overview of the available literature. However, this method was deemed suitable for achieving the objectives of the review. Another potential constraint of this review is its exclusion of articles published in languages other than English and qualitative and review studies.

APPENDIX I

DATABASE SEARCH STRATEGIES

Table 5 Table containing the CINHAI database search strategy.

#	Query	Limiters/Expanders	Results
S15	S8 AND S11 AND S14	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	1,402
S14	S12 OR S13	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	143,577
S13	TI (((worker# OR employee# OR occupational OR industrial) N2 (hazard* OR exposure* OR health OR safety OR hygiene)) OR aubor (work* N1 (capacit* OR abilit* OR resumption* OR schedule* OR table* OR time* OR timing# OR week* OR day# OR load OR environment* OR space OR setting OR place OR life)) OR workload OR work-load OR workday\$ OR work-day# OR workweek# OR work-week*) OR AB (((worker# OR employee# OR occupational OR industrial) N2 (hazard* OR exposure* OR health OR safety OR hygiene)) OR aubor (work* N1 (capacit* OR abilit* OR resumption* OR schedule* OR table* OR time* OR timing# OR week* OR day# OR load OR environment* OR space OR setting OR place OR life)) OR workload OR work-load OR workday\$ OR work-day# OR workweek# OR work-week*) OR MW (((worker# OR employee# OR occupational it OR industrial) N2 (hazard* OR exposure* OR health OR safety OR hygiene)) OR aubor (work* N1 (capacit* OR abilit* OR resumption* OR schedule* OR table* OR time* OR timing# OR week* OR day# OR load OR environment* OR space OR setting OR place OR life)) OR workload OR work-load OR workday\$ OR work-day# OR workweek# OR work-week*))	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	136,907

S12	(MH "Work+") OR (MH "Occupational Health")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	37,081
S11	S9 OR S10	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	821,946
S10	TI (((mental* OR affective OR psycholog* OR stress OR cyclothym* OR dysphor* OR psycho* OR emotion* OR panic) N1 (symptom* OR health* OR ill* OR well* OR disease* OR disorder* OR distress OR adjust*)) OR (depress* OR dysthymi* OR mood# OR anxiet* OR agoraphobi* OR panic OR phobi*) OR (PTSD OR burn-out OR burnout OR "burn out") OR (well-being OR "quality of life" OR quality-of-life OR wellbeing OR "well being" OR self-esteem OR (life N1 satisf*) OR worthwhileness OR QoL)) OR AB (((mental* OR affective OR psycholog* OR stress OR cyclothym* OR dysphor* OR psycho* OR emotion* OR panic) N1 (symptom* OR health* OR ill* OR well* OR disease* OR disorder* OR distress OR adjust*)) OR (depress* OR dysthymi* OR mood# OR anxiet* OR agoraphobi* OR panic OR phobi*) OR (PTSD OR burn-out OR burnout OR "burn out") OR (well-being OR "quality of life" OR quality-of-life OR wellbeing OR "well being" OR self-esteem OR (life N1 satisf*) OR worthwhileness OR QoL)) OR MW (((mental* OR affective OR psycholog* OR stress OR cyclothym* OR dysphor* OR psycho* OR emotion* OR panic) N1 (symptom* OR health* OR ill* OR well* OR disease* OR disorder* OR distress OR adjust*)) OR (depress* OR dysthymi* OR mood# OR anxiet* OR agoraphobi* OR panic OR phobi*) OR (PTSD OR burn-out OR burnout OR "burn out") OR (well-being OR "quality of life" OR quality-of-life OR wellbeing OR "well being" OR self-esteem OR (life N1 satisf*) OR worthwhileness OR QoL))	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	799,193
S9	(MH "Adjustment Disorders") OR (MH "Cyclothymic Disorder") OR (MH "Affective Disorders") OR (MH "Depression+") OR (MH "Asthenia") OR (MH "Quality of Life") OR (MH "Stress Disorders, Post-Traumatic") OR (MH "Psychological Trauma") OR (MH "Stress Disorders, Post-Traumatic") OR (MH "Stress, Psychological") OR (MH "Mental Health") OR (MH "Mental Disorders") OR (MH "Anxiety Disorders") OR (MH "Neurotic Disorders") OR (MH "Mental Disorders Diagnosed in Childhood") OR (MH "Agoraphobia") OR (MH "Separation Anxiety") OR (MH "Panic Disorder") OR (MH "Phobic Disorders") OR (MH "Premenstrual Dysphoric Disorder") OR (MH "Seasonal Affective Disorder")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	407,771
S8	S5 OR S6 OR S7	Expanders - Apply equivalent subjects	Display

		Search modes - Boolean/Phrase	
S7	(MH "SARS-CoV-2") OR (MH "COVID-19 Pandemic") OR (MH "COVID-19") OR (MH "COVID-19 Testing") OR (MH "COVID-19 Vaccines")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Display
S6	TI (("2019" N2 (coronavirus or CoV or nCoV)) or COVID19 or COVID-19 or ((Novel or New or "2") N1 (corona-vir* or Coronavir*)) or SARS2 or SARS-CoV-2 or (SARS N1 ("2" or coronaviri* or corona-vir*)) or nCov or 2019ncov or ncov2019) OR AB (("2019" N2 (coronavirus or CoV or nCoV)) or COVID19 or COVID-19 or ((Novel or New or "2") N1 (corona-vir* or Coronavir*)) or SARS2 or SARS-CoV-2 or (SARS N1 ("2" or coronaviri* or corona-vir*)) or nCov or 2019ncov or ncov2019) OR MW (("2019" N2 (coronavirus or CoV or nCoV)) or COVID19 or COVID-19 or ((Novel or New or "2") N1 (corona-vir* or Coronavir*)) or SARS2 or SARS-CoV-2 or (SARS N1 ("2" or coronaviri* or corona-vir*)) or nCov or 2019ncov or ncov2019))	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Display
S5	S3 OR S4	Limiters - Published Date: 20191101- Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Display
S4	(MH "Coronaviridae+") OR (MH "Coronaviridae Infections+") OR TI (Betacoronavirus or Beta-coronavirus or Coronavir* or corona-vir* or COVID) OR AB (Betacoronavirus or Beta-coronavirus or Coronavir* or corona-vir* or COVID) OR MW (Betacoronavirus or Beta-coronavirus or Coronavir* or corona-vir* or COVID)	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Display
S3	S1 AND S2	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Display
S2	(MH "Disease Outbreaks") OR (MH "Epidemiology+") OR MW Epidemiology OR	Expanders - Apply equivalent subjects	Display

		Search modes - Boolean/Phrase	
S1	(MH "Pneumonia, Viral") OR (MH "Pneumonia") OR (MH "Viruses+")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Display

Table 6 Table containing the Embase database search strategy.

#	Query	Results
S22	S8 AND S16 AND S21	3635
S21	S17 OR S18 OR S19 OR S20	518411
S20	((aged NEAR/2 worker*):ti,ab,kw) OR employabilit*:ti,ab,kw	3193
S19	(work* NEAR/2 (capacit* OR abilit* OR resumption* OR schedule* OR table* OR time* OR timing\$ OR week* OR day\$ OR load OR environment* OR space OR setting OR place OR life)):ti,ab,kw	123492
S18	((worker\$ OR employee\$ OR occupational OR industrial) NEAR/3 (hazard* OR exposure* OR health OR safety OR hygiene)):ti,ab,kw	137992
S17	'occupational health'/exp OR 'occupational health service'/de OR 'occupational health nursing'/de OR 'occupational physician'/de OR 'work'/exp/mj	366918
S16	S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15	2318910
S15	'quality of life':ti,ab,kw OR wellbeing:ti,ab,kw OR 'well being':ti,ab,kw OR 'self esteem':ti,ab,kw OR ((life NEAR/2 satisf*):ti,ab,kw) OR worthwhileness:ti,ab,kw OR qol:ti,ab,kw	660328
S14	'quality of life'/de	542562
S13	ptsd:ti,ab,kw OR burnout:ti,ab,kw OR 'burn out':ti,ab,kw	59707
S12	depress*:ti,ab,kw OR dysthymi*:ti,ab,kw OR mood\$:ti,ab,kw OR anxiet*:ti,ab,kw OR agoraphobi*:ti,ab,kw OR panic:ti,ab,kw OR phobi*:ti,ab,kw	927510
S11	((mental* OR affective OR psycholog* OR stress OR cyclothym* OR dysphor* OR psycho* OR emotion* OR panic) NEAR/2 (symptom* OR health* OR ill* OR well* OR disease* OR disorder* OR distress OR adjust*)):ti,ab,kw	587098
S10	'posttraumatic stress disorder'/de OR 'adjustment disorder'/de OR 'psychotrauma'/de OR 'acute stress disorder'/de	83213
S9	'mental disease'/de OR 'mental disorders therapy'/de OR 'mental disorders complications'/de OR 'mental disorders etiology'/de OR 'mental disorders diagnosis'/de OR 'mental disorders rehabilitation'/de OR 'mental disorders psychology'/de OR 'mental disorders physiology'/de OR	1029143

	'mental disorders in infant and child'/de OR 'anxiety disorder'/de OR 'agoraphobia'/de OR 'separation anxiety'/de OR 'neurocirculatory asthenia therapy'/de OR 'neurocirculatory asthenia differential diagnosis'/de OR 'neurocirculatory asthenia diagnosis'/de OR 'neurosis'/de OR 'panic'/de OR 'panic disorder severity scale self report'/de OR 'panic disorder with agoraphobia'/de OR 'phobia'/de OR 'mood disorder'/de OR 'mood disorder questionnaire'/de OR 'depression'/de OR 'major depression'/de OR 'treatment resistant depression'/de OR 'postnatal depression'/de OR 'dysthymia'/de OR 'premenstrual dysphoric disorder'/de OR 'seasonal affective disorder'/de OR 'cyclothymia'/de OR 'mental health'/de OR 'mental health care'/de OR 'mental health service'/de OR 'non profit organization'/de OR 'psychiatric nursing'/de OR 'mental health center'/de	
S8	S5 OR S6 OR S7	314073
S7	'coronavirus disease 2019'/exp OR 'severe acute respiratory syndrome coronavirus 2'/exp OR 'sars-cov-2 vaccine'/exp OR 'covid-19 testing'/exp	207077
S6	((2019 NEXT/0 novel):ti,ab,kw) OR ((2019 NEXT/0 cov):ti,ab,kw) OR ((coronavirus NEXT/0 disease NEXT/0 2019):ti,ab,kw) OR covid19:ti,ab,kw OR 'covid 19':ti,ab,kw OR (((novel OR new) NEXT/0 corona*):ti,ab,kw) OR sars2:ti,ab,kw OR 'sars cov 2':ti,ab,kw OR ((sars NEAR/2 coronaviridae):ti,ab,kw) OR coronavirus:ti,ab,kw OR sars:ti,ab,kw OR ((coronavirus NEXT/0 '2'):ti,ab,kw) OR ncov:ti,ab,kw OR 2019ncov:ti,ab,kw	251691
S5	S4 AND [1-11-2019]/sd	35028
S4	S1 OR S2 OR S3	289784
S3	betacoronavirus:ti,ab,kw OR 'beta coronavirus':ti,ab,kw OR coronavirus*:ti,ab,kw OR covid:ti,ab,kw	30518
S2	'coronaviridae'/exp OR 'coronavirus infection'/exp OR 'betacoronavirus'/exp	42397
S1	('pneumonia'/de OR 'virus pneumonia'/de OR 'virus'/exp) AND ('epidemic'/exp OR 'epidemiology'/exp OR epidemiology:lnk)	253417

Table 7 Table containing the Medline database search strategy.

#	Query	Results
S19	S8 AND S17 AND S18	2520
S18	Occupational Health/ or exp Work/ or ((worker? or employee? or occupational or industrial) adj3 (hazard* or exposure* or health or safety or hygiene)).mp. or ((aged adj2 worker*) or employabilit* or (work* adj2 (capacit* or abilit* or resumption* or schedule* or table* or time* or timing? or week* or day? or load or environment* or space or setting or place or life)) or workload or work-load or workday? or work-day? or workweek? or work-week*).mp.	348349
S17	or/9-16	1667526
S16	(well-being or "quality of life" or quality-of-life or wellbeing or "well being" or self-esteem or (life adj2 satisf*) or worthwhileness or QoL).mp.	515016
S15	"Quality of Life"/	233717
S14	(PTSD or burn-out or burnout or "burn out").mp.	51778
S13	(depress* or dysthymi* or mood? or anxiet* or agoraphobi* or panic or phobi*).mp.	798462
S12	((mental* or affective or psycholog* or stress or cyclothym* or dysphor* or psycho* or emotion* or panic) adj2 (symptom* or health* or ill* or well* or disease* or disorder* or distress or adjust*)).mp.	659626
S11	"trauma and stressor related disorders"/ or adjustment disorders/ or psychological trauma/ or stress disorders, post-traumatic/ or stress disorders, traumatic, acute/	43146
S10	Mental Health/	50793
S9	mental disorders/ or anxiety disorders/ or agoraphobia/ or anxiety, separation/ or neurocirculatory asthenia/ or neurotic disorders/ or panic disorder/ or phobic disorders/ or mood disorders/ or depressive disorder/ or depression, postpartum/ or depressive disorder, major/ or depressive disorder, treatment-resistant/ or dysthymic disorder/ or premenstrual dysphoric disorder/ or seasonal affective disorder/ or cyclothymic disorder/	345731
S8	S6 OR S7	236647
S7	COVID-19/ or COVID-19 Vaccines/ or exp COVID-19 Testing/ or SARS-CoV-2/	143870

S6	S4 OR S5	236647
S5	((("2019" adj (novel or new) adj corona*) or ("2019" adj (CoV or nCoV)) or (coronavirus adj (disease adj "2019"))) or COVID19 or COVID-19 or ((Novel or New) adj Corona*) or SARS2 or SARS-CoV-2 or (SARS adj2 (coronaviridae or coronavirus)) or ((sars or Coronavirus) adj "2") or nCov or 2019ncov).mp.	232890
S4	limit 3 to ez="20191101-20220115"	217847
S3	S1 OR S2	247738
S2	(Betacoronavirus or Beta-coronavirus or Coronavirus* or COVID).mp.	241960
S1	coronaviridae/ or exp coronavirus/ or exp Coronavirus Infections/ or exp Betacoronavirus/	160724

APPENDIX II

QUANTIFICATION OF DATA

Table 8 Quantification of data.
Table 8 1 Study location

Table 8.1 1 Study location in 496 articles

Country	Number
Argentina	5
Australia	6
Austria	1
Bangladesh	5
Belgium	4
Brazil	17
Bulgaria	1
Canada	14
Chile	2
China	47
USA	45
Cyprus	2
Denmark	2
UAE	3
Ecuador	1
Egypt	6
Ethiopia	7
Finland	2
France	13
Germany	4

Country	Number
Ghana	2
Greece	5
Hong Kong	1
India	25
Indonesia	4
International	20
Iran	22
Iraq	3
Ireland	4
Italy	27
Japan	11
Jordan	4
South Korea	8
Kuwait	1
Lithuania	1
UK	13
Libya	1
Lebanon	1
Latvia	1
Malaysia	4

Country	Number
Mexico	4
Morocco	1
Russia	4
Nepal	7
Netherlands	3
Nigeria	4
Norway	1
Palestine	2
Oman	2
Pakistan	10
Peru	1
Poland	4
Portugal	6
Qatar	2
Moldova	1
Romania	2
KSA	18
Serbia	1
Singapore	7
South Africa	2

Country	Number
Taiwan	5
Spain	23
Sri Lanka	1
Sweden	1
Switzerland	1
Tunisia	1
Turkey	32
Uganda	3
Vietnam	2

Table 8.1 2 Study location in 25 articles

Country	Number
Australia	1
China	1
International	1
Ireland	2
Italy	3
Japan	1
New Zealand	1
Oman	1
Saudi Arabia	1
Pakistan	1
Turkey	1
UK	3
US	8

Table 8 2 Type of profession.

Table 8.2 1 Type of profession in 496 articles

Occupation	Number	Sub-occupation
HCWs	452	<ul style="list-style-type: none"> • Physicians, Residents, Fellows, Trainees, Interns, Students • Nurses, Nurse Technicians • Midwives • Administrative/Supportive Staff • Psychotherapists, Psychologists • Radiology Technicians • Laboratory Professionals • Nutritionists • Public Health Officers • Social Workers • Ambulance Crews, Paramedics, Emergency Medical Technicians • Frontline HCWs (COVID-19 Jobs) • Primary Caregivers • Physiotherapists • Medical Secretaries • Medical Consultants • Dentists, Dental Assistants, Dental Technicians • Palliative Care Workers
Teachers	10	<ul style="list-style-type: none"> • Lecturers • Professors • Primary/ Secondary School Teachers • University Teachers • Basketball Coaches • Physical Education Teachers • Public School Teachers • Department Heads, Principals

Table 8.2 2 Type of profession in 25 articles

Occupation	Number	Sub-occupation
HCWs	21	<ul style="list-style-type: none"> • Nurses • Doctors/ Physicians • Consultant • Resident • Intern • Allied health professionals • Pharmacists • Frontline health professionals • Social workers • Counselors • Advanced practice providers • General and Family Practitioners • Non-consultant psychiatry doctors • Internal medicine • Obstetric/pediatrics • Surgery Psychiatry
Diverse Workers	4	<ul style="list-style-type: none"> • Clerical work • Sales • Service • Professional work • Faculty • Staff • Postdoctoral fellows

Law Enforcement	3	<ul style="list-style-type: none"> • Traffic Police Personnel • Military Personnel • Prison Officers
Diverse Workers	31	<ul style="list-style-type: none"> • Office Clerks • Fashion Retailers • Factory Workers • Managers, Executives, Corporates • Self-Employed • Seafarers • Technicians, IT Professionals • Domestic Helpers • Public Sector Workers • Security Workers • Financial Sector, Insurance Workers • Firefighters • Marketing • Clerical Workers • Sales, Retail and Wholesale Workers • Cargo Drivers

Table 8 3 Sample size and sampling method.

Table 8.3 1 Sample size and sampling method in 496 articles

Sample Size	Number
Less than 100 participants	46
100 – 500 participants	246
501 – 1000 participants	96
1001 – 1500 participants	39
1501 – 2000 participants	13
2001 – 2500 participants	15
2501 – 3000 participants	6
3001 – 3500 participants	6
3501 – 4000 participants	3
4001 – 4500 participants	2
4501 – 5000 participants	1
5001 – 5500 participants	0
5501 – 6000 participants	1
6001 participants and above	20

Sampling Method	Number
Convenience Sampling	69
Snowball Sampling	40
Random Sampling	24
Cluster Sampling	7
Census Sampling	5
Non-Probabilistic Sampling	7
Consecutive Sampling	3
Purposive Sampling	3
Multi-Stage Stratified Sampling	3

Sampling Method	Number
Purposive Sampling	3
Multi-Stage Stratified Sampling	3
Others (voluntary, self-selecting, non-random, non-uniform, universal, and respondent-driven probability sampling methods)	6
N/A	329

Table 8.3 2 Sample size and sampling method in 25 articles

Sample Size	Number
Less than 100 participants	2
100 – 500 participants	8
501 – 1000 participants	9
1001 – 1500 participants	1
1501 – 2000 participants	0
2001 – 2500 participants	1
2501 – 3000 participants	0
3001 – 3500 participants	1
3501 – 4000 participants	1
4001 – 4500 participants	1
4501 – 5000 participants	0
5001 – 5500 participants	0
5501 – 6000 participants	1
6001 participants and above	0

Sampling Method	Number
Convenience Sampling	9
Snowball Sampling	1
Cluster Sampling	1
N/A	14

Table 8 4 Study design.

Table 8.4 1 Study design in 496 articles

Study Design	Number
Cross-Sectional	422
Cross-Sectional Descriptive	31
Cross-Sectional Descriptive-Analytical	6
Cross-Sectional Observational	8
Cohort/ Longitudinal Prospective	24
Retrospective	2
Randomized Controlled Trial (RCT)	1
Cross-Sectional AND Cohort	2

Table 8.4 2 Study design in 25 articles

Study Design	Number
Cross-Sectional	25

Table 8 5 Gender treatment in the article.

Table 8.5 1 Gender treatment in 496 articles

Gender Treatment	Number
Used as covariate	395
Adjusted for in analysis	93
Separate analysis for males and females	7
N/A	1

Table 8.5 2 Gender treatment in 25 articles

Gender Treatment	Number
Used as covariate	19
Adjusted for in analysis	6
Separate analysis for males and females	0
N/A	0

Table 8 6 Gender of participants.

Table 8.6 1 Gender of participants in 496 articles

Gender	Number
Majority Female (more than 50% F)	352
Majority Male (more than 50% M)	91
Equal or Almost Equal (50-50 / 49-51)	25
Almost or All Female (99-100% F)	7
Almost or All Male (99-100% M)	2
N/A	19

Table 8.6 2 Gender of participants in 25 articles

Gender	Number
Majority Female (more than 50% F)	18
Majority Male (more than 50% M)	4
Equal or Almost Equal (50-50 / 49-51)	1
Almost or All Female (99-100% F)	0
Almost or All Male (99-100% M)	0
N/A	2

Table 8 7 Data collection method.

Table 8.7 1 Data collection method in 496 articles

Data Collection Method	Number
Online Self-Administered Questionnaire	462
Paper Self-Administered Questionnaire	22
Mix of Online and Paper Self-Administered Questionnaires	3
Face-to-Face / Telephone Interview	4
Secondary Data (Registries, Records, etc.)	1
N/A	4

Table 8.7 2 Data collection method in 25 articles

Data Collection Method	Number
Online Self-Administered Questionnaire	25

Table 8 8 Outcomes studied.

Table 8.8 1 Outcomes studied in 496 articles

	Number of Studies
Assessing 1 outcome only	213
Assessing more than 1 outcome	281
N/A	2

Table 8.8 2 Outcomes studied in 25 articles

	Number of Studies
Assessing 1 outcome only	6
Assessing more than 1 outcome	19

Outcome Assessed	Number of Studies
Burnout	163
Depression	208
Anxiety	240
Stress	121
PTSD	76
Insomnia	52
Psychological Distress	57
Quality of Life	20
Physical Health/Somatic Symptoms	21
Mental Health (General Term)	25
Fear of COVID-19/COVID-19 Anxiety	28
Emotional Exhaustion	7
Resilience	24
Job Satisfaction	10
Suicide	6
Wellbeing	22
Work and Social Impairment	5

Outcome Assessed	Number of Studies
Burnout	8
Depression	3
Anxiety	7
Stress	5
PTSD	2
Work-Life Balance	1
Psychological Distress	2
Quality of Life	1
Fear of COVID-19/COVID-19 Anxiety	2
Resilience	1
Job Satisfaction	1
Suicide	1

Compassion Fatigue/Compassion Fatigue	8
Intent to Leave Workplace/Change Career	7
Risk Perception/ Self Perceived Health	4
Loneliness	6
Coping Strategies	3
AUD / SUD	6
Moral Injury	3
Panic Attack	2
Work Performance	4
Obsession	3
Hopelessness	2
Acute Stress	6
Any Mental Disorder	3
Self-Efficacy	6
Mood	2
Support	10
Fatigue	4
Fear	4
Others (eating attitudes, patient safety, PPE compliance, ability to control emotions, hand hygiene)	10

Wellbeing	25
Compassion Fatigue/Compassion Fatigue	1
Coping Strategies	1
Moral Injury	1
Self-Efficacy	1
Others (eating attitudes, patient safety, PPE compliance, ability to control emotions, hand hygiene)	3

Table 8 9 Age of participants.

Table 8.9 1 Age of participants in 496 articles

Age of participants	Number of articles
N/A	36
Age range: 18-55+ years with no mean and no percentages	180
Age range: 18-55+ years with percentages and no mean	90
Age range: 18-55+ years with mean between 20-60 and no percentages	29
Age range: 18-55+ years with mean between 20-60 and with percentages	4
Mean between 20-60 with no age range and no percentages	150
Mean for each subgroup in the study with no age range and no percentages	6
Mean for each subgroup in the study with age range and no percentages	1

Table 8.9 2 Age of participants in 25 articles

Age of participants	Number of articles
N/A	3
Age range: 18-55+ years with no mean and no percentages	0
Age range: 18-55+ years with percentages and no mean	11
Age range: 18-55+ years with mean between 20-60 and no percentages	1
Age range: 18-55+ years with mean between 20-60 and with percentages	0
Mean between 20-60 with no age range and no percentages	10
Mean for each subgroup in the study with no age range and no percentages	0
Mean for each subgroup in the study with age range and no percentages	0

APPENDIX III

DATA ABSTRACTION TABLES

Table 9 Data abstraction table.

Table 9 1 Data abstraction for 25 included articles.

Table 9.1 1 Data abstraction table studies about healthcare workers.

Table 9.1.1 1 Data abstraction table studies about healthcare workers **PART ONE.**

In-Text Reference	Study Location	Study Objective	Study population (1) Type of Occupation/ Profession (2) Level	1) Sample Size 2) Sampling Method 3) Response Rate	Age of Participants	Gender of Participants	Study Design	Data Collection Methods	1) Type of Data Analysis 2) Exposure and Outcome Models
Aggar et al., 2022	Australia	This study aims to explore the impact of pandemic-related stress experienced by nurses working in the acute care sector during COVID-19 on psychological adjustment outcomes	(1) HCWs (2) Nurses	1) 767 HCWs 2) Convenience sample 3) 60.63%	Mean age: 45.93 years	686 F (89.45%) 81 M (10.55%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive statistics - Combination of one-way analysis of variance (ANOVA) and correlational analysis - Multiple regression analyses 2) Exposure to demographics and stress correlated with depression, anxiety, stress, wellbeing, self-compassion, and post-traumatic growth
Wang et al., 2022b	China	The present study sought to explore the prevalence of MI and its association with clinician mental health and burnout in a national physician/ nurse sample using an online survey	(1) HCWs (2) Nursing Internal medicine Obstetric/pediatrics Surgery Psychiatry	1) 3006 HCWs (583 nurses and 2423 physicians)	- Mean (SD) 35.4 (8.1) - Age range: 20-70 years	1957 F (65.1%) 1049 M (34.9%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive Statistics - Pearson correlations - Receiver operating characteristic curve (ROC) analysis - Chi-square trend tests

			Other	2) N/A 3) 20.30%					- Unconditional logistic regression modeling 2) Exposure to caring for patients during the COVID-19 pandemic correlated with mental injury, mental health, and burnout
Collins et al., 2022	International - 32 different European countries - Palestine	This study aims to measure the frequency of distress and wellbeing among general/family practitioners during the COVID-19 pandemic and identify levers that could potentially mitigate the risk of distress	(1) HCWs (2) General and Family Practitioners	1) 3711 2) Convenience sampling method 3) 27.80%	N/A	N/A	Cross-Sectional Study	Online self-administered questionnaire	1) - Linear mixed model analysis - Logistic regression 2) Exposure to occupational and personal characteristics correlated with the prevalence of distress and wellbeing among GPs
Brady et al., 2021	Ireland	This study aims to quantify the mental health of nursing home staff during the COVID-19 pandemic in the Republic of Ireland	(1) HCWs (2) Nursing home staff	1) 390 HCWs 2) Convenience sampling 3) 10.20%	- ≤ 30 years (n= 85) - 31-50 years (n= 187) - ≥ 51 years (n= 118)	337 F (86.4%) 53 M (12.8%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive statistics - Chi-square - ANOVA - Post-hoc analyses - Linear model 2) Exposure to demographics and information on COVID-19 correlated with PTSS, wellbeing, suicidal ideations, and coping strategies
McLoughlin et al., 2022	Ireland	This study aims to evaluate the impact of COVID-19 on (1) burnout, (2) work satisfaction, and (3) psychological wellbeing in non-consultant psychiatry doctors in Ireland, and to identify potential contributory factors	(1) HCWs (2) Non-consultant psychiatry doctors	1) 105 doctors 2) N/A 3) 21.00%	- 20–29 years (n= 20) (19%) - 30–39 years (n= 71) (68%) - 40–49 years (n= 9) (9%)	66 F (63%) 39 M (37%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive Statistics - Shapiro-Wilk test - Cronbach's alpha coefficients - Chi-square test - Fisher's exact test - T test - Wilcoxon Rank-sum test - No Bonferroni correction 2) Exposure to sociodemographic correlated

					- 50–59 years (n= 5) (5%)				with burnout, work satisfaction, and psychological wellbeing
De Sio et al., 2021b	Italy	This study aims to assess wellbeing and psychological distress on Italian occupational physicians', in relation to demographic and occupational characteristics, lifestyle and habits during the lockdown period	(1) HCWs (2) Occupational physicians	1) 202 HCWs 2) Convenience sampling 3) 71.40%	Mean age: 51 years	79 F (39.11%) 123 M (60.89%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive statistics - Univariate analysis - Levene's test - Post-hoc tukey test 2) Exposure to demographic occupational lifestyle and habits correlated with PD and perceived wellbeing
De Sio et al., 2020	Italy	This study aims to assess the consequences of the COVID-19 pandemic on Italian doctors' wellbeing and psychological distress, in respect of demographic and occupational characteristics, lifestyle and habits during the lockdown period	(1) HCWs (2) Doctors	1) 695 HCWs 2) Convenience sampling 3) 32.45%	Mean age: 45 years	316 F (45.47%) 379 M (54.53%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive statistics - Univariate analysis - Multivariate regression analysis 2) Exposure to PD and perceived wellbeing
Slykerman, Li, & Booth, 2022	New Zealand	This study aims to 1) Assess the psychological health over time of nurses working during the COVID-19-19 pandemic 2) Examine the actors associated with stress, anxiety, and psychological wellbeing	(1) HCWs (2) Nurses	1) 484 HCWs 2) N/A 3) 80.70%	- 18-24 years (n= 68) - 25-34 years (n= 184) - 35-44 years (n= 115) - 45-54 years (n= 132) - 55-70 years (n= 101)	469 F (96.8%) 15 M (3.2%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Sample t-test - Chi-square tests - Linear regression models 2) Exposure to demographics correlated with stress, anxiety, and psychological wellbeing
Badahdah et al., 2021	Oman	This study aims to detect the prevalence of mental health issues in sample of physicians	(1) HCWs (2) Physicians Nurses	1) 509 HCWs	Mean age: 37.67 years	409 F (80.3%) 100 M (19.7%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Chi-square - Pearson correlation

		and nurses working in several health facilities in Oman		2) Convenience sample 3) N/A					2) Exposure to anxiety, stress, and wellbeing
Asghar et al., 2021	Pakistan	This study aimed at documenting the effect of corona phobia on mental wellbeing and reporting the burnout among the physicians of a tertiary care hospital with the largest COVID-19 isolation unit in Karachi, Pakistan A secondary aim was to evaluate the association between sociodemographic factors with burnout and corona phobia among health-care physicians.	(1) HCWs (2) Consultant Resident Intern	1) 87 Physicians 2) Non-probability convenient-based sample technique 3) N/A	Mean (SD) 30.9 (7.3)	47 F (54.0%) 40 M (46.0%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive analysis - T-test - Fisher's exact test - χ^2 test - Spearman's correlation - Multiple linear regression 2) Exposure to corona phobia correlated with mental wellbeing and burnout Exposure to sociodemographic factors correlated with burnout and corona phobia
Abo-Ali et al., 2021	Saudi Arabia	This study aims to assess mental wellbeing (MW), self-efficacy (SE), and their predictors among healthcare workers (HCWs) in Saudi Arabia during the COVID-19 pandemic	(1) HCWs (2) N/A	1) 1046 HCWs 2) Cluster random sampling 3) 97.00%	Mean age: 35.4 years	520 F (49.7%) 526 M (50.3%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive statistics - Binary logistic regression 2) Exposure to sociodemographic correlated with mental wellbeing and self-efficacy
Yayla, & Eskici İlgin, 2021	Turkey	This study aims to determine the relationship of nurses' psychological well-being with their corona phobia and work-life balance during the COVID-19 pandemic	(1) HCWs (2) Nurses	1) 29 HCWs 2) N/A 3) 91.90%	Mean age: 30.92 years	20 F (67.5%) 9 M (32.5%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive statistics - Pearson correlation - Linear regression analysis 2) Exposure to sociodemographic correlated with corona phobia, psychological wellbeing, and work-life balance
Douglas et al., 2022	United Kingdom	This study aims to investigate the prevalence of burnout and evaluated wellbeing and quality	(1) HCWs (2) Doctors Nurses	1) 234 participants	- 18-24 years (n= 7) (3%)	161 F (69.4%) 103 M (30.6%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive analysis - Chi-square test

		of life (QoL) in HCWs at a single UK neuroscience institution	Allied health professionals (AHPs)	2) N/A 3) 57.40%	- 25-34 years (n=93) (40.1%) - 35-44 years (n=68) (29.3%) - 45-54 years (n=52) (22.4%) - 55-64 years (n=12) (5.2%)				2) Exposure to sociodemographic correlated with the prevalence of burnout, wellbeing, and health-related quality
Bhamra, Parmar, & Heinrich, 2021	United Kingdom	This study aims to explore the impact of the coronavirus pandemic on UK-based Community Pharmacy Teams' (CPTs) professional practice and personal wellbeing to plan for future crises	(1) HCWs (2) Pre-regs Pharmacists Pharmacy technicians Accredited checking technicians Dispensers Healthcare assistants Managers Owners	1) 758 HCWs 2) Snowball sampling method 3) N/A	- 20 and below (n=12) - 21 to 30 years (n=261) - 31 to 40 years (n=147) - 41 to 50 years (n=73) - 51 to 60 years (n=55) - 61 and above (n=12)	384 F (69%) 170 M (30%) 3 non-binary (0.5%) 3 prefer not to say (0.5%)	Cross-Sectional Study	Online self-administered questionnaire	1) Thematic analysis 2) Exposure to PPE, changes to supply/demand of medication, other COVID-19 factors correlated with CP personal and professional wellbeing
Moerdler et al., 2022	United States	This study aims to determine the prevalence and associated predictors of burnout and emotional wellbeing of providers and staff	(1) HCWs (2) Frontline health professionals	1) 682 participants 2) N/A 3) 35.00%	- 18-30 years (n=153) - 31-50 years (n=390) - 51-64 years (n=122)	600 F (88%) 81 M (11.9%) 1 Prefer not to answer (0.4%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive statistics - Multivariable and univariable logistic regression 2) Exposure to sociodemographic correlated with burnout, stress, and emotional wellbeing

					- ≥ 65 years (n= 15)				
Blevins et al., 2022	United States	This study aims to assess the impact of organizational changes related to the COVID-19 pandemic on the wellbeing of HCWs who treat patients with opioid use disorder	(1) HCWs (2) Addiction and non-addiction specialist physicians Practice nurses Physician assistants Psychologists Social workers Counselors	1) 812 HCWs 2) N/A 3) N/A	- Below 30 (n=12) - 30 to 39 years (n=158) - 40 to 49 years (n=159) - 50 to 59 years (n=180) - 60 to 69 years (n=208) - 70 and above (n=92)	380 F (47%) 430 M (53%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive analysis - Multilevel multivariate logistic regression models 2) Exposure to characteristics of HCWs correlated with the degree to which COVID-19 affected anxiety and work life balance
Dugani et al., 2021	United States	The goal of this study was to provide a long-term framework for tracking the health of Internal Medicine hospitalists and evaluating their reaction to support initiatives	(1) HCWs (2) Physician Advanced practice providers (NP and PA)	1) 154 participants 2) N/A 3) 52.20%	- < 40 years (n= 87) (56.9%) - ≥ 40 years (n= 66) (43.1%)	85 F (56%) 84 M (54%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive analysis - T-tests 2) Exposure to working in a COVID-19 team correlated with wellbeing, levels of anxiety, and social isolation
Montoya et al., 2021	United States	This study aims to 1) Assess the mental health and wellbeing of nephrology nurses in the workplace 2) Assess the additional psychological burden related to COVID-19	(1) HCWs (2) Nephrology nurses	1) 393 HCWs 2) N/A 3) N/A	Mean (SD) 52.9 (10.5)	362 F (92.1%) 28 M (7.1%) 3 Prefer not to answer (0.8%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive statistics - Stratified analyses - Logistic regression models 2) Exposure to demographics and occupational characteristics correlated with psychological wellbeing
Moerdler et al., 2021	United States	This study aims to investigate how the pandemic has affected the burnout, stress, and emotional wellbeing of pediatric hematology oncology (PHO)	(1) HCWs (2) Pediatric Hematology Oncology providers	1) 252 HCWs 2) N/A 3) 35.00%	- 18-30 years (n= 46)	223 F (88.5%) 29 M (11.5%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive statistics - Multivariable and univariable logistic and linear regression analyses

		providers and staff in the New York and New Jersey epicenter			- 31-50 years (n= 120) - 51-64 years (n= 76) - ≥ 65 years (n= 9) - Prefer not to answer (n= 1)				2) Exposure to socio demographics and occupational characteristics correlated with burnout, stress, and emotional wellbeing
Thompson Munn et al., 2021	United States	This study aims to identify modifiable environmental factors in the workplace that affect the wellbeing and resilience of health care workers during the COVID-19 pandemic	(1) HCWs (2) Nurses	1) 2459 HCWs 2) Convenience sample 3) 40.18%	N/A	N/A	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive statistics - Univariate logistic regression - ANOVA - Multiple logistic regression - Multiple linear regression 2) Exposure to demographics and work experiences correlated with wellbeing, resilience, and psychological safety
Margolis et al., 2022	United States	The researcher sought to determine how the initial COVID-19 outbreak affected members of the Society for Pediatric Anesthesia (SPA) on both personal and professional levels. Specifically, they examined the potential effects of gender and age on personal stress, burnout, sleep deprivation, anxiety, depression, assessed job satisfaction, and explored financial impact	(1) HCWs (2) Pediatric Anesthesiologists	1) 561 respondents 2) N/A 3) 17.00%	Mean age: 45 years	266 F (56.2%) 199 M (42.1%) 0 Transgender female, gender nonconforming, different identity (0.0%) 1 Transgender male (0.2%) 0 Different identity (0.0%) 7 Decline to state (1.5%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive Statistics - Univariate analyses - Wilcoxon Rank Sum test - Fisher exact test - Multivariable logistic regression models - Multivariable linear regression model 2) Exposure to socio-demographic factors correlated with stress, burnout, sleep deprivation, anxiety, depression, job satisfaction, and financial impacts

Table 9.1.1 2 Data abstraction table studies about healthcare workers **PART TWO.**

In-Text Reference	Exposure Assessed Tools Used to Assess Exposure	Outcomes Assessed Tools Used to Assess Outcomes	Confounders/ Variables adjusted or controlled for in the models	Gender treatment in the article	Journal Quartile	Main Findings	Limitations of the Study	Main Conclusion of the Study/ Policy Implications
Aggar et al., 2022	<p>1. Exposure: Demographic characteristics and pandemic context variables Tool: Questionnaire</p> <p>2. Exposure: Stress Tool: Impact of Event Scale - Revised (IES-R)</p>	<p>1. Outcome: Depression, anxiety, and stress Tool: Depression, Anxiety and Stress Scale (DASS-21)</p> <p>2. Outcome: Subjective wellbeing Tool: The World Health Organization-Five wellbeing Index (WHO-5)</p> <p>3. Outcome: Self-compassion Tool: Self-Compassion Scale–Short</p> <p>4. Outcome: Post-traumatic growth Tool: Posttraumatic Growth Inventory</p>	Demographics	Adjusted for in analysis	Q1	<p>1) Approximately one-fifth of nurses reported high levels of COVID-19 pandemic-related stress to indicate clinical concern for posttraumatic stress.</p> <p>2) Greater pandemic related stress experienced by nurses in this study was associated with caring for COVID-19 patients.</p> <p>3) Pandemic-related stress was a significant predictor of poorer psychological adjustment.</p> <p>4) Self-compassion also protected nurses’ depressive symptoms from the negative impact of pandemic-related stress but was found to exacerbate the negative effect of pandemic-related stress on subjective wellbeing.</p>	<p>1) Non-response bias.</p> <p>2) Unable to measure psychological adjustment in this sample of nurses before the pandemic.</p> <p>3) Cross-sectional design.</p>	<p>1) Self-compassion weakened the relationship between pandemic-related stress and greater depression, however, exacerbated the relationship between pandemic-related stress and less subjective wellbeing.</p> <p>2) Posttraumatic growth reduced the negative relationship between pandemic-related stress and psychological adjustment outcome.</p> <p>3) These findings will inform strategies to facilitate psychological resources that support nurses’ psychological adjustment, enabling better pandemic preparedness at both an individual and organizational level.</p>
Wang et al., 2022b	<p>1. Exposure: Sociodemographic Tool: Questionnaire</p>	<p>1. Outcome: Moral Injury Tool: The 10-item Moral Injury Symptoms Scale–Health Professional version (MISSHP)</p>	Sociodemographic	Adjusted for in analysis	Q1	<p>1) MISS-HP scores are strongly and positively correlated with depression, anxiety, low wellbeing, and burnout symptoms.</p>	<p>1) A nonrandom sampling method was used in selecting participants, thereby affecting the external validity</p>	<p>1) Effective strategies are needed to address MI and other mental health problems in frontline health care workers treating those with and without COVID-19 disease.</p>

		<p>2. Outcome: Subjective wellbeing Tool: Secure Flourish Index (SFI).</p> <p>3. Outcome: Burnout Tool: Maslach Burnout Inventory–Human Services Survey for Medical Personnel (MBI-HSMP).</p> <p>4. Outcome: Depression Tool: nine-item Patient Health Questionnaire (PHQ-9)</p> <p>5. Outcome: Anxiety Tool: seven-item Generalized Anxiety Disorder (GAD-7)</p>			<p>2) HCPs providing medical care to COVID-19 patients experienced a 28% greater risk of MI than those providing medical care to patients without the coronavirus.</p> <p>3) A significant proportion of HCPs in mainland China are at risk for significant MI symptoms as well as mental health problems and burnout during the COVID-19 pandemic. MI symptoms are strongly correlated with higher clinician burnout, greater psychological distress, and lower level of subjective wellbeing.</p>	<p>in terms of generalizing to HCPs throughout China.</p> <p>2) Other potential characteristics that might explain or confound the relationship between COVID-19 exposure and MI, such as social support and other adverse life events other than workplace exposure, were not assessed, possibly leading to an overestimate or underestimate of the association.</p> <p>3) Due to the lack of a “gold standard,” the cutoff value of MISS-HP was determined based on self-reported functional impairment, which may not be as valid as other standards.</p> <p>4) The cross-sectional design prevents making</p>	
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						<p>causal inferences regarding the relationships between moral injury and other psychological constructs assessed here (mental health, burnout, workplace violence). Poor mental health (depression, anxiety, low wellbeing) may have led to clinician burnout and experiences of MI, just as MI may have led to burnout and mental health symptoms.</p> <p>5) The cause for MI among these HCPs may have been experiences of aggression toward them, having to make life and death decisions, both, or other reasons.</p> <p>6) Assessment of the details of COVID-19 exposure using a single self-report yes/no question is a clear study limitation. Future</p>	
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							research will need to identify the details of health care professionals' exposure to COVID-19 patients and specific other factors most likely to cause moral injuries in HCPs so that recommendations on how to prevent this can be made.	
Collins et al., 2022	1. Exposure: Occupational and personal characteristics Tool: Questionnaire	1. Outcome: Distress Tool: Expanded 9-item Wellbeing Index (eWBI)	N/A	Used as covariate	Q2	<p>1) GPs with less experience, in smaller practices, and with more vulnerable patient populations were at a higher risk of distress.</p> <p>2) Significant differences in wellbeing scores between countries.</p> <p>3) Perception of having adequate governmental support, collaboration from practices in the neighborhood, and having enough protected time to review guidelines and the scientific literature were significant protective factors for distress.</p> <p>4) Increased time pressure due to a higher workload, uncertainties regarding an unknown disease, work reorganization, and potential lack of confidence in caring for COVID-19 patients</p>	<p>1) Questionnaire did not collect data on the wave and stage of COVID-19 at the time of completion.</p> <p>2) Surveys based on a self-selecting sample (volunteer bias).</p> <p>3) Cross-sectional design: direct assessment of causal relationships not possible.</p>	1) Practice and system-level organizational factors are needed to enhance wellbeing and support primary care physicians.

						underpins psychological distress among GPs.		
Brady et al., 2021	1. Exposure: Demographic and COVID-19 information Tool: Questionnaire	1. Outcome: PTSS Tool: Impact of Event Scale - Revised (IES-R) 2. Outcome: Wellbeing Tool: The World Health Organization-Five wellbeing Index (WHO-5) 3. Outcome: Suicidal ideation Tool: Columbia Suicide Severity Rating Scale (C-SSRS) 4. Outcome: Coping strategies Tool: Abbreviated Coping Orientation to Problems Experienced (Brief-COPE)	N/A	Used as covariate	Q1	1) Significant differences between nurses, healthcare assistants (HCA) and non-clinical staff history in age, ethnicity, years' experience, history of COVID-19-19 infection and contact with COVID-19-19 positive acquaintances. 2) Moderate-severe post-traumatic stress disorder symptoms were found in 45.1% of all staff. 3) No between-group differences for suicidal ideation. 4) Nurses were more likely to use approach coping styles than non-clinical staff.	N/A	1) Nursing home staff report high levels of post-traumatic stress, mood disturbance and moral injury during the COVID-19-19 pandemic. 2) Differences in degree of moral injury, wellbeing and coping styles were found between staff groups, which need to be incorporated into planning supports for this neglected workforce.
McLoughlin et al., 2022	1. Exposure: Sociodemographic Tool: Questionnaire	1. Outcome: Burnout Tool: Abbreviated-Maslach Burnout Inventory (MBI) 2. Outcome: Work Satisfaction Tool: Basic Needs Satisfaction at Work Scale	N/A	Used as covariate	Q1	1) The biggest stressor reported was reduced face-to-face contact with family and friends (73%). 2) Forty one percent reported weekly supervision changes. 3) Sixty five percent met the criteria for burnout, compared with 36.2% in 2018.	1) The risk of responder bias and recall bias, given that this was a self-report study. 2) The small sample size and somewhat low response rate.	1) This study highlights the importance of regular supervision and support for this group.

		3. Outcome: Psychological wellbeing Tool: WHO-5 wellbeing Index				4) Significant factors associated with burnout included staff shortages, longer hours, and less experience. 5) Changes in supervision and working in non-European Working Time Directive compliant rotas were associated with lower scores across all subdomains of the BNSW Scale. 6) The WHO-5 wellbeing Index identified 48% scored low in personal wellbeing, indicating these trainees met the threshold for depression. 7) Changes in regular supervision (p=0.010) were a significant predictor of low personal wellbeing.	3) Missing data on other factors that could further influence the findings, such as mental health history.	
De Sio et al., 2021b	1. Exposure: Demographic occupational and lifestyle and habits Tool: Questionnaire	1. Outcome: PD Tool: General Health Questionnaire (GHQ-12) 2. Outcome: Perceived wellbeing Tool: The World Health Organization-Five wellbeing Index (WHO-5)	N/A	Used as covariate	Q1	1) High prevalence of OPs with high risk of psychological distress and low self-reported wellbeing.	1) Cannot demonstrate the existence of a causal relationship. 2) Raw results could lack generalization.	1) High prevalence of psychological distress in occupational physicians. 2) To prevent the occurrence of mental disorders among Occupational Physicians, it is urgent to put in place policies of psychological support and wellbeing preservation.
De Sio et al., 2020	1. Exposure: Demographic occupational and lifestyle and habits	1. Outcome: PD Tool: General Health Questionnaire (GHQ-12)	Age Sex	Adjusted for in analysis	Q2	1) Alarming prevalence of psychological distress and poor perceived wellbeing among doctors.	1) Results' raw materials may lack generalization.	1) A significant psychosocial impact of the COVID-19 outbreak on Italian doctors, particularly among those

	Tool: Questionnaire	2. Outcome: Perceived wellbeing Tool: The World Health Organization-Five wellbeing Index (WHO-5)					2) Sample size is slightly higher than the a priori estimate.	working in the most affected regions of the country. 2) Further studies are necessary to better understand the effects of the COVID-19 pandemic on doctors' wellbeing and mental health over time, in order to implement effective prevention measures.
Slykerman, Li, & Booth, 2022	1. Exposure: Demographic and COVID-19 characteristics Tool: Questionnaire	1. Outcome: Stress Tool: Perceived Stress Scale (PSS) 2. Outcome: Anxiety Tool: State trait anxiety inventory (STAI6) 3. Outcome: Psychological wellbeing Tool: The World Health Organization-Five wellbeing Index (WHO-5)	N/A	Used as covariate	Q1	1) Stress, anxiety, and poor psychological wellbeing scores were high at baseline. 2) Unexpectedly, stress and psychological wellbeing significantly improved between baseline and T2, while anxiety levels increased (could reflect the residual effect of heightened stress during the 2020 COVID-19 pandemic year). 3) Younger nurses had higher baseline stress and anxiety scores. 4) We found no significant difference in baseline psychological health according to the working environment.	1) Generalizability.	1) This study demonstrates the potential beneficial effect of effective public health management of the COVID-19 pandemic on nurses' stress and psychological wellbeing and highlights the importance of longitudinal research to understand psychological health in nurses.
Badahdah et al., 2021	1. Exposure: Sociodemographic Tool: Questionnaire	1. Outcome: Anxiety Tool: Generalized Anxiety Disorder scale (GAD-7)	N/A	Used as covariate	Q1	1) Revealed a high prevalence of stress, anxiety and poor psychological wellbeing, especially among females, young health care workers and those	1) Convenience sampling. 2) Cross-sectional design.	1) The outcomes of this study support the handful of studies published during this global health crisis that have found that the mental health of health care workers has been harshly

		<p>2. Outcome: Perceived stress Tool: Perceived Stress Scale (PSS)</p> <p>3. Outcome: Perceived wellbeing Tool: The World Health Organization-Five wellbeing Index (WHO-5)</p>				<p>who interacted with known or suspected COVID-19 patients.</p>	<p>3) Recruitment via WhatsApp.</p>	<p>affected and predicted that it will continue, to various degrees, to be affected in the foreseeable future.</p> <p>2) The results of this study highlight the urgency of providing administrative and psychological support as well as current and accurate information on COVID-19 to health care workers.</p>
<p>Asghar et al., 2021</p>	<p>1. Exposure: Sociodemographic and Corona phobia Tool: Questionnaire</p>	<p>1. Outcome: Mental Wellbeing Tool: The Warwick-Edinburgh Mental wellbeing Scale (WEMWBS)</p> <p>2. Outcome: Burnout Tool: Maslach Burnout Inventory Human Services Survey for Medical Personnel</p> <p>3. Outcome: Corona phobia Tool: Questionnaire</p>	<p>N/A</p>	<p>Used as covariate</p>	<p>Q1</p>	<p>1) On evaluating burnout status, more than half the participants were observed to experience high levels of emotional exhaustion (54%) and depersonalization (77%). These findings are worrisome, as a meta-analysis has proved emotional exhaustion to correlate negatively with work attitudes among physicians, including professional satisfaction and organizational commitment, quality, and safety, which comprises the time given to patients and management of patient load.</p> <p>2) Resident physicians were reported to experience greater emotional exhaustion ($P = 0.002$) and depersonalization ($P < 0.001$) than consultant physicians in our study. This could be attributed to the fact that these physicians are in the early phase of their medical careers, with limited</p>	<p>1) The study was conducted at a single-center institution with a limited sample size and thus may not reflect the findings of larger populations. Larger multicenter studies need to be conducted to evaluate further the findings of the survey.</p> <p>2) Because no longitudinal follow-up was performed, improvement or worsening of psychological symptoms could not be determined. More studies are needed to understand the</p>	<p>1) Large-scale study protocols should also be undertaken not only to report but also to address the psychological disturbances through these interventions.</p>

						clinical knowledge and experience. 3) Physicians with lower mental wellbeing scores reported greater emotional exhaustion and depersonalization, with personal accomplishment directly proportional to mental wellbeing. This represents the correlation of the MBI-HSS MP with the WEMBWS, which needs to be studied further in larger scale studies.	long-term psychological implications among health-care workers.	
Abo-Ali et al., 2021	1. Exposure: Socio-demographic, health, and occupational characteristics Tool: Questionnaire	1. Outcome: Mental Wellbeing Tool: World Health Organization- Five wellbeing Index (WHO-5) 2. Outcome: Self-efficacy Tool: General Self-Efficacy Scale (GSES)	N/A	Used as covariate	Q2	1) 27.2% had negative MW scores, and 36.6% had low SE scores. 2) Younger and older ages, irregular exercise, nursing professions, history of anxiety and/or depression, lesser years of experience, and longer daily working hours were found to be the main predictors of negative MW and low SE.	1) HCWs who do not have access to the internet and those who are not familiar with online platforms, were not represented in the study.	1) Mental wellbeing (MW) and self-efficacy (SE) of the HCWs in Saudi Arabia are satisfactory but attention should be paid towards supporting the vulnerable groups for promoting the resilience of HCWs during the battle against the current pandemic.
Yayla, & Eskiçi İlgin, 2021	1. Exposure: Sociodemographic Tool: Questionnaire	1. Outcome: Corona phobia Tool: COVID-19Phobia Scale (C19P-S) 2. Outcome: Psychological wellbeing Tool: Psychological Wellbeing (PWB-S) Scale	N/A	Used as covariate	Q1	1) The nurses' work-life balance and psychological wellbeing were negatively affected during the COVID-19pandemic. 2) Their COVID-19phobia was mild-to-moderate level. 3) Nurses' psychological wellbeing was significantly affected by the variable of neglecting life the most, followed	1) This study evaluated the effect of coronavirus phobia and work-life imbalance only on psychological wellbeing of nurses and did not evaluate any work-related feature. 2) Since the study was conducted	1) Corona phobia experienced by nurses and work-life balance was related to their psychological well-being during the COVID-19pandemic. 2) Managers should take measures (regulating the working hours) to decrease nurses' COVID-19phobia (education, counseling or

		3. Outcome: Work-life balance Tool: Work-Life Balance (WLB-S) Scale				by corona phobia and work-life balance. 4) no significant difference among age, gender, marital status, education level and the clinic worked in, in terms of mean Psychological wellbeing Scale scores. This result may be attributed to the fact that the psychological problems caused by the pandemic occur because of the common denominator of being a nurse rather than these variables.	online, the nurses who did not use social media tools could not be contacted.	psychotherapy) and work-life imbalance.
Douglas et al., 2022	1. Exposure: Sociodemographic, working hours during the pandemic surge, training, redeployment, and access to personal protective equipment, experience of personal risk, and psychological state Tool: Questionnaire and Visual Analogue Scales (VAS)	1. Outcome: Prevalence of burnout Tool: The single-item Emotional Exhaustion (EE) and Depersonalization (DP) scales 2. Outcome: Wellbeing Tool: Linear Analogue Self-Assessment (LASA) Scale 3. Outcome: Health-related Quality of Life Tool: EuroQol-5 Dimension (EQ-5D)	N/A	Used as covariate	Q1	1) The overall prevalence of burnout measured using the EE and DP scales was 21.4% and 12.1%, respectively. 2) There was no difference in wellbeing between professional categories or among HCWs of different ages, sexes, or races; the overall mean LASA score was 6.92. 3) Overall, 65.4% of respondents had witnessed loved ones, friends, or colleagues become ill with COVID-19. 4) In total, 24.4% of respondents said they didn't get enough sleep throughout the pandemic, and 40.9% said their communication was subpar owing to job weariness.	1) Survey high in selection bias because the population in our study were HCW working in a neuroscience center. 2) Not all the factors that contributed to anxiety and stress were measured, hence the more probability of bias. 3) As a cross-sectional study, it is difficult to infer causality; only associations can be inferred.	1) We discovered a higher risk of burnout among nurses and employees from racial and ethnic minorities. 2) The importance of clear ways and policies to support employee wellness and the need for ongoing assessment during and after this pandemic.

							4) Difficulties determining the direct impact of the pandemic on the levels of burnout because we did not have any information regarding the levels of burnout before the pandemic.	
Bhamra, Parmar, & Heinrich, 2021	1. Exposure: Demographics, resources and information, patient experience, complementary therapies Tool: Questionnaire	1. Outcome: Impact on professional practice and wellbeing Tool: Questionnaire	N/A	Used as covariate	Q2	1) Key challenges identified: fear of contracting and passing the virus to others, patients stockpiling medicine. 2) PPE shortages at the beginning of the pandemic amplified challenges to CPT members (stress, anxiety, depression, loneliness). 3) Working in CP during the pandemic led 45% of participants to reconsider their career. Reasons: lack of recognition and support for the profession, salary, long working hours, feeling undervalued and unappreciated. 4) Some positive experiences of working in CP during the pandemic: patients being kinder and more considerate.	N/A	1) Support for CPTs needs to be improved to enable them to continue practicing professionally and also to safeguard their personal wellbeing. 2) CP needs investment in resources, information and most importantly staff-wellbeing. 3) Preparedness of CPs as frontline service needs to be strengthened as a core response in case of a pandemic.
Moerdler et al., 2022	1. Exposure: Sociodemographic, occupational characteristics and COVID-19experiences	1. Outcome: Burnout Tool: Validated single-item burnout measure focusing on	N/A	Used as covariate	Q1	1)Variability in experiences based on hospital role, lack of trust in leadership, and deployment.	1) Cannot generalize.	1) While the majority of PHO providers and staff were resilient during the early stages of the COVID-19pandemic, many reported high levels of

	Tool: Questionnaire	the emotional exhaustion subscale 2. Outcome: Stress Tool: Perceived Stress Scale 4 (PSS-4) 3. Outcome: Emotional wellbeing Tool: Patient Health Questionnaire-4 (PHQ-4)				2) half of the participants reported high levels of burnout, average stress scores were in the mild-moderate range, and the majority scored in the none-to-mild symptomatology range for their wellbeing.	2) Self-reporting may be subjective and vulnerable to recall bias, social desirability bias, nonresponse bias.	burnout, yet few are utilizing institutional resources. 2) This study has highlighted several actionable areas to help identify and address factors that are wearing down the emotional wellbeing of providers and staff.
Blevins et al., 2022	1. Exposure: Organizational practices and related HCP experiences Tool: Questionnaire	1. Outcome: HCP wellbeing and work-life balance Tool: Questionnaire	Age Sex Relationship status Hours worked per week	Adjusted for in analysis	Q1	1) Difficulty with functioning: positively associated with having staff who were sick with COVID-19 and feeling close to patients. Negatively associated with being male and having no staff changes. 2) Difficulty with work-life balance: positively associated with addiction board certification; working in multiple settings; having layoffs, furloughs, or reduced hours; staff illness with COVID-19; and group wellbeing check-ins. Negatively associated with male gender, older age, and no staff changes. 3) Working in multiple practice settings is more likely to report negative impacts on work-life balance (increase administrative demand).	1) Convenience sample. 2) Low number of responses received from Black/Hispanic providers. 3) Results may be affected by the changing course of the COVID-19 pandemic. 4) Measure of wellbeing is broad, no use of validated burnout scales.	1) Employers should consider specific needs of women, younger HCWs and HCWs who work in multiple settings. 2) Evaluate the intention of wellbeing check-ins and consider the structure and frequency to focus on genuine wellbeing needs and avoid infringement on work-life balance. 3) Further research to determine whether COVID-19-related functionally impairing anxiety and work-life balance disruptions persist and what interventions should be implemented to mitigate harms. 4) Particular focus to Black, Indigenous, Hispanic HCWs given known differential

						4) No significant associations between demographic area and either measure of HCW wellbeing after accounting for clustering of HCWs within states.		impacts and disparities in health care delivery for these groups before and during the COVID-19 pandemic.
Dugani et al., 2021	1. Exposure: Working in a COVID-19 team, Sociodemographic information and professional information Tool: Questionnaire	1. Outcome: Wellbeing Tool: Questionnaire 2. Outcome: Levels of anxiety Tools: Questionnaire 3. Outcome: Social isolation, and emotional support Tools: Emotional Support computerized adaptive test and questions	N/A	Used as covariate	Q2	1) Over 95% of hospitalists reported low scores on the eight measures of anxiety. 2) Similar to scores for anxiety, over 95% of hospitalists reported low scores for social isolation prior to the pandemic. 3) When compared to before the pandemic (57.3 7.4), the mean score for emotional support (standard deviation) decreased during the pandemic (54.9 8.4). 4) During the pandemic, compared to prior to the pandemic, there was a decrease in global wellbeing and increase in anxiety and social isolation; there was a relatively smaller decrease in emotional support.	1) Due to the low response rate (52%), the study may not accurately represent the views of those who did not answer.	1) In addition to allowing for the monitoring of interventions intended to support Internal Medicine hospitalists during and after the pandemic and evaluating the impact of pandemic-related psychological stress on provider burnout and attrition, the results of this survey provide baseline levels of psychological stress.
Montoya et al., 2021	1. Exposure: Demographic Tool: Questionnaire 2. Outcome: Occupational characteristics Tool: Workload subscale instrument from the revised Individual	1. Outcome: Psychological wellbeing Tool: Generalized Anxiety Disorder scale (GAD-7) Patient Health Questionnaire 2-item (PHQ-2)	Age Race United States census region	Adjusted for in analysis	Q3	1) High psychological burden experienced by nephrology nurses; nearly two-thirds (62%) of respondents reported feeling burned out from work, and about one of five (18%) reported moderate to severe anxiety. 2) 51% of the nephrology nurses who responded reported working	1) Small sample size. 2) Survey results may have been impacted by the timing of the study in relation to COVID-19 in the United States and	1) The nephrology community must come together to develop additional tools and resources to support the mental health of nephrology nurses in the workplace. 2) A multidimensional approach is needed to provide evidence-based strategies

	Workload Perception Scale (IWPS-R)					40 or more hours per week; 23% reported working 45 hours or more per week. While this survey did not determine why respondents worked extra hours, it may be that employers required extra hours for some and that others chose to take on extra hours due to the COVID-19 pandemic.	may not be generalizable to the current situation or to the situation in other countries. 3) Recall bias. 4) Study was observational in nature, so no causal inference can be drawn.	aimed at improving the mental wellbeing of nephrology nurses. 3) Individual clinicians, health care administrators, and those influencing policy change have an obligation to systematically address the key factors that lead to increased rates of nephrology nurse burnout, depression, anxiety, and stress.
Moerdler et al., 2021	1. Exposure: Sociodemographic, occupational characteristics and COVID-19 experiences Tool: Questionnaire	1. Outcome: Burnout Tool: Validated single-item burnout measure focusing on the emotional exhaustion subscale 2. Outcome: Stress Tool: Perceived Stress Scale 4 (PSS-4) 3. Outcome: Emotional wellbeing Tool: Patient Health Questionnaire-5 (PHQ-5)	N/A	Used as covariate	Q1	1) Approximately half somewhat or strongly agreed that they were worried about PHO patients not receiving the same care and more were concerned about not having the same relationship with their PHO patients because of the pandemic. 2) Range of emotional experiences among PHO providers and staff, with more than half of the participants reporting high levels of burnout.	1) Cannot generalize. 2) Limited ability to note particular hospital settings or practices that affect resilience and wellbeing. 3) Cannot distinguish between responders and non-responders.	1) PHO providers and staff in the NYC/NJ area are experiencing a range of emotional experiences during the COVID-19 pandemic, but the majority are not using current resources. 2) With the continuation of the pandemic, we must continue efforts to improve provider and staff distress to mitigate the degree of potential negative short-term and long-term impact.
Thompson Munn et al., 2021	1. Exposure: Demographics and work experiences during COVID-19 Tool: Questionnaire	1. Outcome: Wellbeing Tool: wellbeing Inventory (WBI) 2. Outcome: Resilience	HCW role Employment location	Used as covariate	Q3	1) Several factors significantly increased the likelihood of at-risk wellbeing: lower level of resilience, using support resources, feeling the organization lacked understanding of the emotional support needs of health care	1) 50% of workers did not want to participate. 2) Cross-sectional.	1) This study identified several work environment factors that have significantly affected health care workers' wellbeing and resilience during the COVID-19 pandemic.

		<p>Tool: Connor-Davidson Resilience Scale (CD-RISC)</p> <p>3. Outcome: Psychological safety Tool: Psychological Safety Scale</p>				<p>workers during the pandemic, believing the workload had increased, believing there was insufficient personal protective equipment, believing there was inadequate staffing to safely care for patients, and having a lower degree of psychological safety.</p> <p>2) Several factors were found to be significantly associated with higher levels of resilience: positive perceptions about the organization's understanding of the emotional support needs of health care workers during the pandemic, believing sufficient educational resources were available regarding the care of COVID-19 patients, having positive perceptions of leadership support from direct managers, having positive perceptions of the redeployment policy, and having a higher degree of psychological safety.</p>		<p>2) This knowledge has practical relevance for health care leaders who aim to better understand and address the wellbeing and resilience of the health care workforce during this pandemic and beyond.</p>
<p>Margolis et al., 2022</p>	<p>1. Exposure: Sociodemographic Tool: Questionnaire</p>	<p>1. Outcome: Wellbeing: social isolation, perceived stress, job satisfaction, anxiety, and depression Tool: Positive Emotions, Engagement, Relationships, Meaning, Accomplishment, Health (PERMAH) wellbeing survey</p>	<p>N/A</p>	<p>Used as covariate</p>	<p>Q1</p>	<p>1) Because of COVID-19, 21.7% of respondents said they would change their clinical responsibilities, and 10.6% would decrease their professional working time.</p> <p>2) Women were more likely than men to anticipate a future COVID-19-related job change (odds ratio [OR] = 1.92, 95% confidence interval [CI], 1.12-2.63; P = .011), perhaps because</p>	<p>1) A low response rate is a potential source of bias as results are only representative of those who replied.</p> <p>2) Because the physician anesthesiologists surveyed practice primarily at North American medical</p>	<p>1) Thus, it is imperative that as a collective group, we act now more than ever to encourage wellbeing interventions that combat loneliness and burnout in pediatric anesthesiologists.</p>

		2. Outcome: Burnout Tool: Modified 2- question summative Maslach Burnout Inventory (MBI)			<p>of increased home responsibilities (OR = 2.63, 95% CI, 1.74-4.00; P < .001).</p> <p>3) Additionally, 14.2% of respondents planned to retire early, and 11.9% planned to retire later.</p> <p>4) Women and non-White respondents had higher likelihoods of burnout on univariate analysis (OR = 1.75, 95% CI, 1.06-2.94, P = .026 and OR = 1.82, 95% CI, 1.08-3.04, P = .017, respectively), and 25.1% of all respondents felt socially isolated.</p> <p>5) In addition, both changes in retirement planning and future occupational planning were strongly associated with total job satisfaction scores (both P < .001).</p>	<p>institutions and belong to SPA, our results may not be reflective of non-SPA members, physicians in training, nurse anesthetists, or practitioners in other countries, thereby limiting the generalizability of the findings.</p> <p>3) With all survey studies, respondents may not be 100% truthful in their responses and may not have carefully read the questions or thought through their responses before answering.</p>	
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Table 9.1 2 Data abstraction table studies about non-healthcare workers.

Table 9.1.2 1 Data abstraction table studies about non-healthcare workers **PART ONE.**

In-Text Reference	Study Location	Study Objective	Study population (1) Type of Occupation/ Profession (2) Level	1) Sample Size 2) Sampling Method 3) Response Rate	Age of Participants	Gender of Participants	Study Design	Data Collection Methods	1) Type of Data Analysis 2) Exposure and Outcome Models
(Platts, Breckon, & Marshall, 2022)	United Kingdom	This study examined the combined impact of age, gender, dependents, mental health status and work status in relation to enforced home-working and the effects on wellbeing markers including stress, burnout, depressive symptoms, and sleep in UK employees	(1) Diverse (2) N/A	1) 623 participants 2) N/A 3) N/A	- 16–24 years (n= 30) (5%) - 25–34 years (n= 135) (22%) - 35–44 years (n= 149) (24%) - 45–54 years (n= 200) (32%) - 55+ years (n= 109) (17%)	384 F (62%) 234 M (38%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive Statistics - MANOVA and MANCOVA - T-tests - One-way ANOVA - Regression trees 2) Exposure to sociodemographic and enforced homeworking correlated with stress, burnout, depressive symptoms, and sleep
(de Sio et al., 2021a)	Italy	This study aims to assess the consequences of the COVID-19 pandemic on job organization, exploring the effects of lockdown measures on psychological distress and perceived wellbeing among workers experiencing telework	(1) Workers (2) N/A	1) 575 workers 2) convenience sampling 3) 70.04%	Mean age: 40 years	348 F (60.52%) 227 M (39.48%)	Cross-Sectional Study	Online self-administered questionnaire	1) - Descriptive statistics - Univariate analysis - Levene's test - Post-hoc turkey test 2) Exposure to demographic and occupational lifestyle and habits correlated PD and perceived wellbeing

(Tomono et al., 2021)	Japan	This study aimed to examine how the combination of changes in overtime working hours and social interaction affects the full-time employees' mental wellbeing, focusing on the difference in household composition	(1) Diverse (2) Clerical work Sales Service Professional work Other	1) 4388 Workers 2) N/A 3) 15.13%	- 25–34 years (n= 1298) - 35–44 years (n= 1145) - 45–54 years (n= 1058) - 55–64 years (n= 887)	1515 F (34.53%) 2873 M (65.47%)	Cross- Sectional Study	Online self- administered questionnaire	1) - Descriptive Statistics - Cross-tabulation - Chi-square tests - Multivariate logistic regression analysis 2) Exposure to changes in overtime working hours and social interaction correlated with mental wellbeing
(Evanoff et al., 2020)	United States	The aim of this study is to measure the prevalence of stress, anxiety, depression, work exhaustion, burnout, and decreased wellbeing among faculty and staff at a university and academic medical center during the SARS-CoV-2 pandemic and describe work-related and personal factors associated with their mental health and wellbeing	(1) Different professions (2) Faculty Staff Postdoctoral fellows in a university including its medical school	1) 5550 respondents 2) N/A 3) 34.30%	N/A	4274 F (77.3%) 1182 M (21.4%) 24 Diverse (0.4%) 51 Prefer not to say (0.9%)	Cross- Sectional Study	Online self- administered questionnaire	1) Univariable and multivariable Poisson regression 2) - Exposure to COVID-19 correlated with stress, anxiety, depression, work exhaustion, burnout, and decreased wellbeing - Exposure to lockdowns correlated with stress, anxiety, depression, work exhaustion, burnout, and decreased wellbeing

Table 9.1.2 2 Data abstraction table studies about non-healthcare workers **PART TWO.**

In-Text Reference	Exposure Assessed Tools Used to Assess Exposure	Outcomes Assessed Tools Used to Assess Outcomes	Confounders/ Variables adjusted or controlled for in the models	Gender treatment in the article	Journal Quartile	Main Findings	Limitations of the Study	Main Conclusion of the Study/ Policy Implications
(Platts, Breckon, & Marshall, 2022)	1. Exposure: Sociodemographic Tool: Questionnaire	1. Outcome: Job-related and health and wellbeing factors Tool: Third Copenhagen Psychosocial Risk Assessment Questionnaire (COPSOQIII)	Quality of leadership and work-life conflict	Used as covariate	Q1	<p>1) 81% of respondents were working at home either full or part-time (n=623, 62% female).</p> <p>2) Detrimental health impacts of homeworking during lockdown were most acutely experienced by those with existing mental health conditions regardless of age, gender, or work status, and were exacerbated by working regular overtime.</p> <p>3) In those without mental health conditions, predictors of stress and depressive symptoms were being female, under 45 years, home-working part-time and two dependents, though men reported greater levels of work-life conflict.</p> <p>4) Place and pattern of work had a greater impact on women. Lower leadership quality was a significant</p>	<p>1) Working practices, especially for office-based individuals, are forever-changed. There is a need for research to consider the unique and varied contexts within which employees now work and to apply a range of quantitative and qualitative methods to understand both the ‘what’ and ‘why’ of home-working and its impact on individuals using validated tools.</p> <p>2) A cross-sectional survey design was chosen for this study due to the ease and speed of implementation in a pandemic context, however the limitations of this design are acknowledged, as is the risk of sampling</p>	<p>1) Experience of homeworking under lockdown varies amongst groups. Knowledge of these differences provide employers with tools to better manage employee wellbeing during periods of crisis. While personal factors are not controllable, the quality of leadership provided to employees, and the ‘place and pattern’ of work, can be actively managed to positive effect. Innovative flexible working practices will help to build greater workforce resilience.</p>

						<p>predictor of stress and burnout for both men and women, and, for employees aged >45 years, had significant impact on level of depressive symptoms experienced.</p>	<p>and survey bias.</p> <p>3) Tough efforts were made to limit this, the analysis is susceptible to random statistical error due to sample size.</p> <p>4) Equally, the homogenous geographical location of participants must be considered. Nevertheless, this study provides critical insights and direction for future research, which must consider the mediators and moderators of employee wellbeing across larger and geographically diverse groups and provide frameworks for organizations to monitor and evaluate the effect of the workplace, be that office-based, or a blend of both.</p>	
(de Sio et al., 2021a)	1. Exposure: Demographic occupational and	1. Outcome: PD Tool: General	N/A	Used as covariate	Q2	1) People with lower educational levels had a lower risk of psychological	1) Results' raw materials may lack generalization.	1) It is mandatory to pay more and more attention to

	lifestyle and habits Tool: Questionnaire	Health Questionnaire (GHQ-12) 2. Outcome: Perceived wellbeing Tool: The World Health Organization- Five wellbeing Index (WHO- 5)				distress than those with higher educational levels.		the mental health of teleworkers, considering the increasing diffusion and adoption of this type of work organization.
(Tomono et al., 2021)	1. Exposure: Overtime working hours, Social Interactions, combination of overtime working hours and social interaction, household composition, and potential confounders Tool: Questionnaire	1. Outcome: Wellbeing Tool: WHO- Five wellbeing Index (WHO- 5)	Demographic variables Other potential confounders (ie, employment status, occupation, presence/absence of the increase in working from home, amount of housework, household income, household composition, current mental wellbeing, sleep hours, frequency of drinking, presence/absence of close people with COVID-19, and presence/absence of constant information gathering regarding COVID-19)	Adjusted for in analysis	Q2	1) Almost half of the study participants had reported deterioration of mental wellbeing since the COVID- 19outbreak started in Japan. 2) Interestingly, those who coded as “decreased overtime/ decreased interaction” and “decreased overtime/unchanged interaction” also tended to reveal the deterioration of psychological wellbeing. 3) In this study, the household composition itself was not associated with the deterioration of mental wellbeing, whereas it was also revealed that living in a single-person household	1) To contact the participants during the pandemic, it was necessary to use a web-based survey. 2) Applicants for participation in the survey were accepted in the order of receipt until the number of participants reached the quotas. Due to this procedure, there is a possibility that the subjects who are potentially interested in this study may gather faster to apply. 3) For these reasons, there might be	1) In the pandemic, it is necessary to pay close attention to both overtime working hours and the presence of social interaction to address the mental wellbeing among employees

					<p>was associated with worsening of a harmful impact of “increased overtime/decreased interaction” combination on the psychological wellbeing.</p> <p>4) Female workers, especially those who are in multi-person households, may have unique vulnerability to deterioration of mental wellbeing due to an increase in the burden of household chores in the “stay home” recommendation during the COVID-19 pandemic.</p>	<p>selection biases that could limit our findings.</p> <p>4) Because of the Internet-based questionnaire, all participants answered the questions in the form of a self-report.</p> <p>5) The cross-sectional nature of this study made it difficult to determine the causality between overtime working hours, social interaction, and deterioration of mental wellbeing.</p> <p>6) Although the questionnaire item was developed to assess the changes in mental wellbeing, the amount of overtime working hours, the opportunity of social interaction, and other variables, it is almost impossible to exclude recall biases from the survey.</p> <p>7) In the adopted</p>	
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							<p>questionnaire, the researcher could not obtain the information about, for example, the accessibility of preventive measures (eg, face mask and medical supply) against the COVID-19, the presence of financial vulnerability, or fear of job loss.</p> <p>8) The questionnaire was written in Japanese and distributed to citizens in the metropolis of Tokyo and the three surrounding prefectures.</p> <p>9) The participants answered the questionnaire after the second wave of COVID-19, the state of mental wellbeing in the general public might differ by the time point during the period.</p> <p>10) The eligibility of this study made it difficult to analyze the</p>	
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							difference in deterioration of mental wellbeing between genders given the fact that the gender composition of the study sample was unbalanced (ie, single household men: 14.5%, multi-household men: 51.0%, single household women; 10.8%, multi-household women: 23.7%).	
(Evanoff et al., 2020)	1. Exposure: Working with COVID-19 patients and working from home Tool: Questionnaire	1. Outcome: Stress, anxiety, and depression Tool: Depression, Anxiety and Stress Scale - 21 items (DASS-21) 2. Outcome: Burnout and work exhaustion Tool: Professional Fulfillment Index (PFI) and	N/A	Used as covariate	Q1	1) Faculty, staff, and postdoctoral fellows all reported a high prevalence of worsened overall wellbeing (58.3%) related to COVID-19work or life changes. 2) Moderate to high levels of stress were reported by 13%, anxiety by 13%, depression by 15.9%, and high work exhaustion by 43%. 3) Three factors were statically significant associated with a higher prevalence of all five	1) This is a cross-sectional study and thus the associations between potential risk factors and outcomes of health and wellbeing may not be casual. 2) The overall response rate was 34.5% which means that the respondents may not be fully representative of all university employees. 3) Faculty were less likely to participate	1) Employers, health care systems, and public health agencies should begin interventions to improve mental health and overall wellbeing among healthcare workers and the broader workforce. 2) In addition to traditional wellness interventions addressing resilience and mental health

		changes in wellbeing			<p>outcomes: poor supervisor support/ high number of family and, or home stressors/ and age above 40 years.</p> <p>4) Working closely with COVID-19 patients lead to higher work exhaustion, anxiety, and stress, they also have a higher workload and were more likely to report burnout and depression.</p>	<p>than were staff and comparisons between these groups should be interpreted with caution.</p> <p>4) The study was conducted in one university which may not be representative of other workforces.</p>	<p>issues among individual workers, responses should include support for work/family balance and other organizational changes to improve work conditions for healthcare and other workers.</p>
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APPENDIX IV

LIST OF THE INCLUDED ARTICLES

- Abo-Ali, E. A., Al-Rubaki, S., Lubbad, S., Nchoukati, M., Alqahtani, R., Albraim, S., . . . Zaytoun, S. (2021). Mental well-being and self-efficacy of healthcare workers in saudi arabia during the COVID-19pandemic. *Risk Management and Healthcare Policy*, 14, 3167-3177. doi:10.2147/RMHP.S320421
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