




ORIGINAL RESEARCH:
EMPIRICAL RESEARCH - QUALITATIVE

A qualitative exploration of the National Academy of medicine model of well-being and resilience among healthcare workers during COVID-19

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Abstract

Aims: The aim of this research was to explore factors affecting the well-being and resilience of healthcare workers (HCWs) during COVID-19.

Design: Qualitative content analysis of survey responses to a single, open-ended question.

Methods: The study took place in June and July 2020 in the Mid-Atlantic United States. Qualitative data from 452 HCWs were analysed with deductive content analysis, using a National Academy of Medicine model of factors affecting clinician well-being and resilience. The study is reported according to the Standards for Reporting Qualitative Research and the Consolidated Criteria for Reporting Qualitative Research.

Findings: The findings reflect each of the seven domains of the National Academy of Medicine model, demonstrating the diverse factors that have impacted the well-being and resilience of HCWs during the COVID-19 pandemic. The results of the study show that factors within the workplace have significantly impacted the well-being and resilience of HCWs during the pandemic, in particular, the practice environment and the rules and regulations implemented by healthcare organizations. At the same time, individual and even societal factors have also affected well-being during the pandemic, but not to the same degree as factors within the workplace.

Conclusion: The research findings illustrate how multiple, diverse factors have influenced the well-being and resilience of HCWs during the pandemic. The study has practical relevance for healthcare leaders and important implications for future research.

Impact: Health system leaders can address the well-being and resilience of healthcare workers by implementing solutions that address health system factors like the practice environment and the policies and procedures of the organization. Researchers should not only focus on individual factors associated with professional well-being but must also expand research and interventional studies to include the system and environmental factors that significantly affect clinicians.

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KEYWORDS

burnout, COVID-19, health personnel, National Academy of Medicine, nurse practitioners, nurses, physician assistants, resilience, well-being, work environment

The physical and emotional well-being of the healthcare workforce is essential to the delivery of high-quality healthcare (Berwick, 2020). Over the last decade, burnout has become an increasing threat to clinician and patient well-being (Sweileh, 2020). Additional pressures exerted upon the healthcare system by the COVID-19 pandemic have placed many healthcare workers (HCWs) at further risk of burnout as organizations attempt to respond to this crisis. Therefore, understanding clinician well-being and factors that may contribute to or threaten well-being is essential to the overall functioning of the healthcare system. Although measuring clinician well-being quantitatively through validated instruments is useful, a deeper understanding of well-being and its correlates may be obtained through the examination of the workers' perceptions and experiences in their own words. This study seeks to characterize HCWs' written expressions of their experiences and concerns related to COVID-19 using the National Academy of Medicine (NAM) Model of Clinician Well-Being as an organizing framework.

1 | BACKGROUND

Professional well-being is recognized as a broad phenomenon that encompasses physical, mental and emotional health and one which is influenced by individual as well as environmental, organizational and psychosocial factors (Brigham et al., 2018; Chari et al., 2018; National Academies of Sciences Engineering & Medicine, 2019). In the ideal sense, professional well-being is characterized by professional and personal fulfilment that leads to work engagement, joy in practice and professional thriving (Chari et al., 2018; National Academies of Sciences Engineering & Medicine, 2019). Included within this positive conceptualization of well-being is resilience, which is an individual's capacity to cope with and bounce back from adversity (National Academies of Sciences Engineering & Medicine, 2019). Research demonstrates that resilience is an important contributing factor to overall well-being (Munn et al., 2021). In contrast, poor professional well-being, can have detrimental effects on mental, physical, emotional and psychosocial health as well as professional thriving (Chari et al., 2018; National Academies of Sciences Engineering & Medicine, 2019). Compromised well-being is observed in many forms, but it is most commonly studied as burnout (National Academies of Sciences Engineering & Medicine, 2019).

Burnout is defined by the World Health Organization as an occupational phenomenon characterized by 'energy depletion or exhaustion, feelings of negativism towards one's job and reduced professional efficacy' that contributes to a person's overall well-being (World Health Organization, 2019). Research has shown that nurses and other healthcare providers suffer from burnout at a greater rate than other occupations, with reported prevalence as

high as 30%–54% for nurses (Dyrbye et al., 2019; Kelly et al., 2021). Burnout has detrimental effects on physical and emotional health. Causes for burnout are multifactorial and include personal and organizational factors (National Academies of Sciences Engineering & Medicine, 2019). Clinician burnout has been increasingly recognized as a contributor to poor patient outcomes. Bodenheimer and Sinsky (2014) recognized burnout as a threat to the achievement of the Institute for Healthcare Improvement's Triple Aim. In their landmark paper, they proposed the inclusion of caregiver well-being as the fourth aim in the delivery of quality healthcare in the United States (Bodenheimer & Sinsky, 2014).

2 | SIGNIFICANCE OF THE PROBLEM

Burnout has significant consequences for individual providers, organizations and patients. At the individual level, burnout has been shown to adversely impact both physical and mental health (National Academies of Sciences Engineering & Medicine, 2019). In a systematic review that only included prospective studies conducted in both general and healthcare workforces, burnout was significantly related to the development of type II diabetes, hypercholesterolaemia, hospitalization for cardiovascular disease, musculoskeletal pain, prolonged fatigue and increased mortality prior to the age of 45 (Salvagioni et al., 2017). Burnout was also significantly associated with the development of depressive symptoms and hospitalization for mental health disorders (Salvagioni et al., 2017). Recently, an alarm was sounded (Melnyk, 2020) over the rise in suicide rates among nurses, which are higher than those of the general population with female nurses having 1.39 times the rate of suicide compared with their female non-nurse peers (Davidson et al., 2020).

Within healthcare organizations, burnout has a direct impact on the ability to provide care. In a recent study of over 26,280 HCWs, researchers found that baseline burnout was associated with reduction in hours worked during the subsequent 24 months while satisfaction with the organization was associated with an increase likelihood of maintaining scheduled hours (Dyrbye et al., 2021). Nurse burnout has also been linked to nurse turnover. A large survey study of nurses found a 12% increase in nurse turnover for each 1-unit increase in burnout (Kelly et al., 2021). The strain placed on health systems to repeatedly recruit and train new workers is staggering, with associated cost estimates as high as 90,000 US dollars per nurse (Kelly et al., 2021).

Clinician burnout has also been associated with patient outcomes and quality of care. Higher rates of burnout among nurses are associated with increased urinary tract and surgical site infections (Cimiotti et al., 2012) and increased self-reported medication administration errors (Montgomery et al., 2021). Burnout is also associated

with decreased patient experience scores (Jun et al., 2021) and higher odds of prolonged hospital length of stay and mortality (Schlak et al., 2021).

3 | HEALTHCARE WORKERS WELL-BEING AND COVID-19

The COVID-19 pandemic has heightened concerns surrounding HCW well-being in both the United States and globally. Burnout, anxiety and depression appear to be higher than prepandemic levels in HCWs (Denning et al., 2021) with higher levels of depression and anxiety in HCWs than other occupations (da Silva Neto et al., 2021). A cross-sectional study of US HCWs found that 58% of those surveyed expressed feelings of distress and burnout (Sharma et al., 2021). Burnout and distress did not appear to be related to prevalence of COVID-19 at the time of the study. Pooled data from five studies ($N = 15,394$) found that 34.1% of nurses surveyed expressed emotional exhaustion as measured by the Maslach Burnout Inventory (Galanis et al., 2021). In a survey of 3537 HCWs from the United Kingdom, Poland and Singapore, 67% screened positive for burnout, while the rates for anxiety and depression were 20% and 11% respectively. Several factors have been associated with a greater risk for burnout in HCWs during the pandemic including, younger age, increased workload, decreased social support, working in high-risk environments (Galanis et al., 2021), poor communication with supervisors (Sharma et al., 2021), redeployment within the work setting (Denning et al., 2021), perceived lack of resources (Galanis et al., 2021; Sharma et al., 2021) and pre-existing mental health conditions (Lasalvia et al., 2021). These findings illustrate the multi-faceted nature of professional well-being and the need for frameworks that capture this complexity.

4 | THE NAM CLINICIAN WELL-BEING MODEL

In 2017, to address rising burnout rates and worsening well-being among clinicians, the NAM created an action collaborative of health professionals and researchers from diverse healthcare disciplines (Brigham et al., 2018). The Collaborative developed and published a Conceptual Model for Clinician Well-being and Resilience with the goal to illustrate and guide the understanding of the factors that contribute to burnout and ultimately clinician and patient well-being (National Academies of Medicine, 2019). While there are several conceptual frameworks of clinician well-being, the NAM model is one of the most comprehensive models that is multifactorial and includes both organizational and individual factors that influence clinician well-being (Stewart et al., 2019). Additionally, the NAM model is inclusive of all healthcare professions and settings (Brigham et al., 2018; Stewart et al., 2019). The NAM conceptual model is displayed in Figure 1. Because research demonstrates that health system factors (e.g. staffing, workload) affect burnout to a larger degree

than individual factors, five domains of the module are focused on external factors (Society & Culture, Learning/Practice Environment, Rules & Regulations, Health Care Responsibilities, Organizational Factors) and two domains are focused on individual factors (Personal Factors, Skills & Abilities; Brigham et al., 2018; National Academies of Medicine, 2019).

5 | THE STUDY

5.1 | Aim

This study aimed to explore factors affecting the well-being and resilience of HCWs during the COVID-19 pandemic.

5.2 | Design

We conducted a descriptive, qualitative study using a single, open-ended survey question. This question was part of a 44-item survey used for a large, cross-sectional study of HCWs during COVID-19, which examined organizational factors that contributed to the overall well-being and resilience of HCWs (Munn et al., 2021). The single question from the survey used to collect the qualitative data was worded as follows: 'If there is anything you would like to tell us about this topic, please record below' and provided study participants a way to provide any additional information they wanted to share. The present study is reported following the Standards for Reporting Qualitative Research (O'Brien et al., 2014) and the Consolidated Criteria for Reporting Qualitative Research (Tong et al., 2007).

5.3 | Sample/participants

The study was conducted across nine hospitals, physical rehabilitation facilities, behavioural health facilities and multiple outpatient settings in the Mid-Atlantic Region of the United States (U.S.). The study was conducted during June and July 2020, during a time when knowledge of COVID-19 was still evolving, rates were continuing to increase across the region, and a pressing national concern was shortage of personal protective equipment (PPE). The study used a convenience sample of healthcare technicians (nursing assistants and medical assistants), nurses (registered nurses and licensed practical nurses), advanced practice providers (nurse practitioners, physician assistants, certified registered nurse anaesthetists, certified nurse midwives and clinical nurse specialists), respiratory therapists and therapy services professionals (occupational therapists, speech therapists and physical therapists).

In the original study, there were 2459 HCW participants. Of these, 459 provided qualitative responses to the single, open-ended survey question. Two responses did not contain any answers (i.e. 'Thank you!') and five responses were not relevant to the study (e.g.

FACTORS AFFECTING CLINICIAN WELL-BEING AND RESILIENCE

This conceptual model depicts the factors associated with clinician well-being and resilience; applies these factors across all health care professions, specialties, settings, and career stages; and emphasizes the link between clinician well-being and outcomes for clinicians, patients, and the health system. The model should be used to understand well-being, rather than as a diagnostic or assessment tool. In electronic form, the external and individual factors of the conceptual model are hyperlinked to corresponding landing pages on the Clinician Well-Being Knowledge Hub. The Clinician Well-Being Knowledge Hub provides additional information and resources. The conceptual model will be revised as the field develops and more information becomes available.

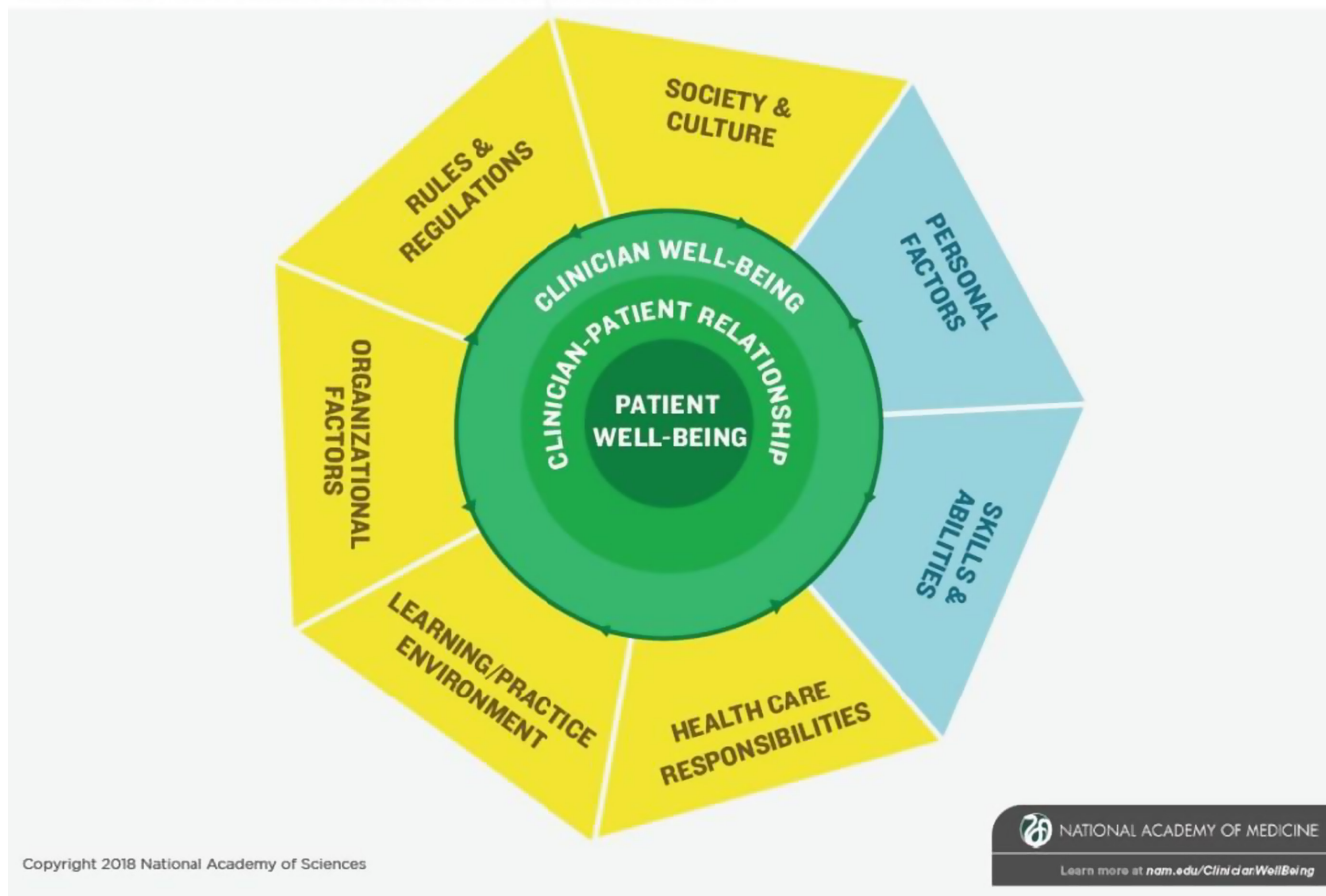


FIGURE 1 National Academy of medicine model of factors affecting clinician well-being and resilience. Brigham et al. (2018). Reproduced with permission from the National Academy of Sciences, Courtesy of the National Academies Press, Washington, DC

comments about the survey construction). In all, responses from 452 HCW were included in the present study.

5.4 | Data collection

Data were collected from June 1 through July 17, 2020, using a self-administered, electronic survey. We used a modified Dillman approach with an initial recruitment letter followed by three reminder letters sent to the email addresses of potential participants; a direct link to the survey was included in the letters (Dillman et al., 2008). Recruitment fliers were displayed in clinical areas where HCWs were employed, and clinical leaders shared information on the study with staff. Research Electronic Data Capture (REDCap), a secure web-based platform, was used for survey administration and data management (Harris et al., 2019, 2009).

5.5 | Ethical considerations

The study was reviewed and approved by the local Institutional Review Board (IRB number: 05-20-11EX). Potential participants received written information on the study. Participation was voluntary and consent was implied by completion of the survey. No identifying information was collected from participants. As a result, survey responses were anonymous with minimal risk to study participants.

5.6 | Data analysis

Data were analysed with deductive content analysis using the *NAM Model for Factors Affecting Clinician Well-being and Resilience* as the conceptual framework (Elo & Kyngäs, 2008; Gale et al., 2013; National Academies of Medicine, 2019). Descriptive statistics of the study sample were analysed with SAS software version 9.4 [Copyright © 2016,

SAS Institute Inc.]. Qualitative responses from HCWs were coded to the seven factors of the NAM model, and all 452 responses fit to at least one NAM category. Data were analysed using ATLAS.ti version 8.

5.7 | Rigour

We used several strategies to enhance rigour of the study (Elo et al., 2014). Before coding, two members of the research team

(LTM and CDC) familiarized themselves with the data; and then used the NAM model domains and definitions, applied to the COVID-19 context, to create the codebook found in Table 1. One research team member (CDC), trained in qualitative methods, coded all data. A second member of the research team (LTM), experienced in workforce research and theoretical perspectives, coded a subset of responses to assess interrater agreement, which was 92%. Coded data were placed into tables and organized according to the seven factors of the NAM model. At each step in

TABLE 1 Codebook for qualitative analysis of study data

NAM domain	Examples of NAM definitions	Application of NAM definitions to COVID-19 study data
Rules and Regulations	<ul style="list-style-type: none"> • Documentation and reporting requirements • Human Resources policies and compensation issues • National and state policies and practices • Shifting systems of care and administrative requirements 	Paid time off, policy related to personal protective equipment, visitation policies, hazard pay
Society and Culture	<ul style="list-style-type: none"> • Alignment of societal expectations and clinician's role • Discrimination and overt and unconscious bias • Media portrayal • Patient behaviours and expectations • Political and economic climates 	Media, societal expectations related to COVID-19, societal behaviours related to COVID-19, political concerns, racial conflict
Learning/Practice Environment	<ul style="list-style-type: none"> • Learning and practice setting • Physical learning and practice conditions • Professional relationships • Team structures and functionality • Workplace safety and violence 	Workload, staffing, direct manager, team dynamics, safety and/or physical conditions
Organizational Factors	<ul style="list-style-type: none"> • Congruent organizational mission and values • Culture, leadership and staff engagement • Level of support for all healthcare team members 	Organizational culture, system-level expectations and standards, employee support related to well-being/resilience
Healthcare Responsibilities	<ul style="list-style-type: none"> • Administrative responsibilities • Clinical responsibilities • Patient population • Specialty-related issues 	Clinical and administrative responsibilities, concerns related to specialty area, concerns related to patient population
Skills and Abilities	<ul style="list-style-type: none"> • Clinical competency level/experience • Organizational skills • Delegation 	Professional skills, clinical experience/expertise
Personal Factors	<ul style="list-style-type: none"> • Family dynamics • Financial stressors/economic vitality • Physical, mental and spiritual well-being • Relationships and social support • Sense of meaning • Work-life integration 	Family/home life, mental health, finances, emotions

Adapted from National Academy of Medicine (2019).

the analysis processes, members of the research team met to review the data and to reach consensus in all aspects of analysis and interpretation.

6 | FINDINGS

Study participants were predominately nurses (67.7%). Most individuals worked in the inpatient setting (67.4%) and most had provided care to COVID-positive patients (75.2%). Among those who responded, just over 50% had at-risk well-being. Previous research has demonstrated at-risk well-being to be associated with a higher risk of distress, including high fatigue, burnout and lower quality of life (Dyrbye et al., 2018). Well-being was measured with the well-being index and scores ranged from -2 to 9, with a score of two or greater defined as 'at-risk' well-being. The mean resilience score for participants, measured with the 10-item Connor-Davidson Resilience Scale, was 30.2. Past studies of resilience in the general population demonstrate mean resilience scores of 31 to 32, with higher scores indicative of greater resilience (Davidson, 2020). Further details on the instruments used to measure well-being and resilience in this study have been discussed in greater detail in a previous publication by these authors (Munn et al., 2021). Table 2 provides additional details on sample characteristics.

A total of 452 qualitative responses were coded to the seven factors of the NAM model: Society & Culture, Rules & Regulations, Organizational Factors, Learning/Practice Environment, Health Care Responsibilities, Skills & Abilities and Personal Factors. Overall, the responses of HCWs reflected each of the seven factors of the NAM model, and many individual responses were consistent with multiple factors of the model. HCW responses predominately focused on external factors, and among those, the learning/practice environment ($N = 237$; 52%) and rules and regulations ($N = 218$; 48%) were the two categories most frequently reflected. Of the two internal factors, personal factors were most frequently reflected in participant responses. Figure 2 provides further detail on frequency and percentage of qualitative responses by each factor of the NAM model.

6.1 | Learning/practice environment

Fifty-two percent of participant responses reflected the Learning/Practice Environment factor of the NAM model. Workload was an important aspect of the Learning/Practice Environment that HCWs discussed. While some participants indicated that staffing was sufficient during the pandemic, many felt they did not have enough staff available or that the available staff did not have the skills necessary to help in their area. As more patients entered facilities and appropriate staffing support decreased, survey participants were concerned about how clinician to patient ratios affected patient safety, teammate stress levels and team morale.

TABLE 2 Characteristics of study participants ($n = 452$)

Characteristic	N (%)	Mean (SD)
Role		
Advanced Practice Provider	80 (17.7)	—
Healthcare Technician	29 (6.4)	—
Nurse	306 (67.7)	—
Respiratory Therapist	11 (2.4)	—
OT/PT/Speech Therapist	15 (3.3)	—
Other/Not Indicated	11 (2.4)	—
Employment setting		
Inpatient	305 (67.4)	—
Outpatient	144 (31.9)	—
Not Indicated	3 (0.7)	—
Provided care to COVID patients		
Yes	340 (75.2)	—
No	110 (24.3)	—
Not Indicated	2 (0.4)	—
Well-Being		
At-Risk	246 (54.4)	—
Not-at-Risk	206 (46.4)	—
Resilience	—	30.2 (5.9)

Note: Some percentages may not sum to 100% due to rounding. Well-Being was measured with the Well-Being Index, At-risk well-being was defined as a score of ≥ 2 and not-at-risk well-being, a score of < 2 . Resilience was measured with the 10-item Connor Davidson Resilience scale.

Abbreviations: OT, occupational therapist; PT, physical therapist.

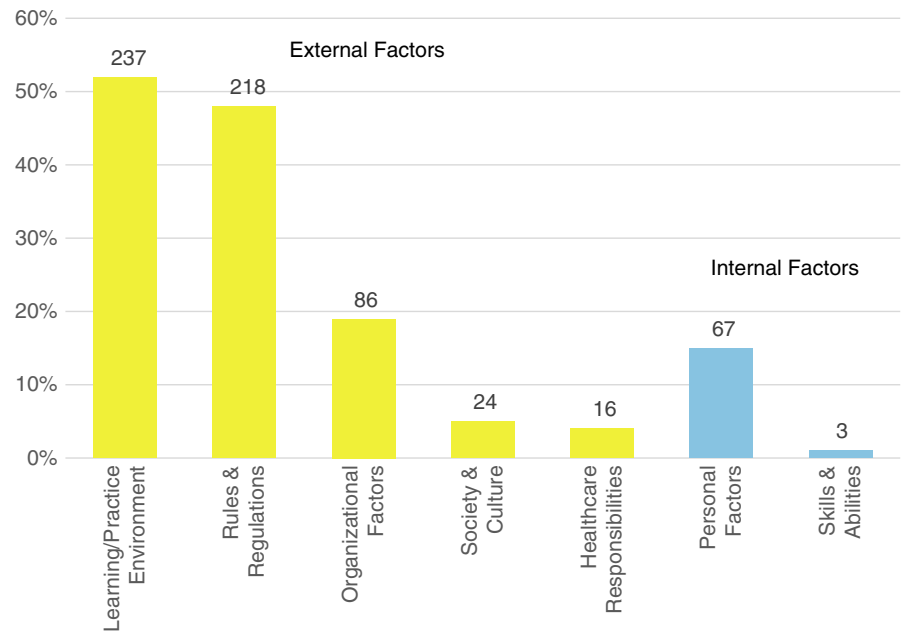
I am grateful we had enough staffing to survive COVID. Things were already busy before and we could never have [made] it from a safety, morale, and turnover standpoint if we had been forced to have tight APP staffing. HCW1634, Advanced Practice Provider (APP)

"My unit has been overloaded with patients during the pandemic. There were very few days that we were not at capacity and almost every day understaffed to a point that we were worried about patient safety. ... Almost everyone on this unit is tired, frustrated and burnt out."

HCW454, Nurse

Healthcare workers' interactions with their co-workers and managers also had a significant influence on well-being and resilience in the workplace. Several employees said they appreciated support from their managers and co-workers, which helped them better cope with the stress and responsibilities related to the pandemic. Conversely, others were very frustrated with how their supervisor handled

FIGURE 2 Frequency and percentage of participant responses, by factor of the National Academy of medicine model of clinician well-being and resilience (N = 452). Note: Some responses were coded to more than one domain



situations at work, especially related to communication effectiveness. Concerns about management included poor and unclear communication, paternalistic attitudes, lack of support, and shaming or silencing of employee thoughts and concerns. Team morale and co-worker stress levels also influenced employee experiences at work.

"The director of our department, [name of director], did an amazing job communicating the latest changes, research, and protocols. Keeping the department safe was [their] foremost priority."

HCW504, Nurse

Healthcare workers identified added emotional and mental support needs in their local practice. One participant appreciated the presence of chaplains at their location. Others suggested increasing recognition of employees by their leaders. Another survey respondent said that providing food for HCWs was not enough to help and that more focus on emotional support and allowing for greater self-care was needed. Further responses discussed the need for more break time and respite rooms to improve emotional wellbeing.

It would be nice to have someone available every day and night to come around to the units to check to see how we are doing. As well offer us sometime [sic] (if permitted) to talk with them and vent if needed."

HCW2842, Health Care Technician

(HCT)

Many HCWs expressed concerns about their personal safety and potential exposure to COVID-19 in their work environments. HCWs felt uneasy about personal risks through exposure to patients, visitors and even other coworkers. They felt it was not fair to be placed

at increased risk for exposure in the workplace compared with their counterparts who worked remotely. Several participants described how the shortage of personal protective equipment (PPE) and sanitation tools was concerning. Some HCWs were unsure if they would be informed about confirmed exposures to infected patients or co-workers. They were also concerned that limited access to appropriate resources like PPE would threaten the safety of themselves and their families.

Work is terrifying now. Re-opening the offices to more patients [equals] more chance of exposure with [COVID-19] positive patients.

HCW448, APP The lack of PPE was the highest cause of stress.

HCW762, APP

Participants described their physical environments at work and how they influenced their experiences during the pandemic. Some were concerned about available space to practice social distancing in facilities while others indicated a preference for conducting virtual rather than in-person visits with patients. Other participants voiced that their well-being was influenced by which clinical location they moved to for their assignments.

I have felt anxious about reentry back into the office setting as there are a lot of unanswered questions, and our physical workspace does not allow the recommended 6 feet of social distancing while working. We also have restrooms used by patients in the clinic and no dedicated EVS [Environmental Services] staff to clean between each patient.

HCW293, Nurse

6.2 | Rules and regulations

Forty-eight percent of participant responses reflected the Rules and Regulations factor of the NAM model. Many participants commented on how frequent changes to workplace rules and regulations during the pandemic affected their stress.

I think that the accumulation of new policies that have developed from COVID, (less staff, visitor restrictions, high patient acuity) have led to increased burnout for me personally and on my unit.

HCW1113, Nurse

Healthcare workers also expressed concern over how their personal safety was affected by rules and regulations in their organizations, and how this further compounded their stress. These concerns predominately focused on policies surrounding the use of PPE and visitation practices. Interestingly, the visitation policies affected HCWs in a number of ways. While some saw limiting visitors as important to their safety, other HCWs expressed the negative effects of limiting visitors.

It is unsafe to allow parents and immediate family who ha[ve] tested positive for COVID or live with someone who has tested positive to continue to visit. They should have to test negative at least once, this would decrease the amount of 'accidental exposures' we continue to have.

HCW2751, Nurse

Something that I have noticed is without family present most of my patients are unable to do anything for themselves (toileting, drinking water, etc.). In my opinion, this has been a main contributor to increased workload.

HCW1113, Nurse

Healthcare workers also expressed how rules and regulations regarding work schedules, overtime and paid time off (PTO) affected their well-being and resilience. Several participants voiced the need for additional compensation during the pandemic due to the risk of exposure and infection that they faced.

Due to COVID-19 we have not been able to receive overtime. With that policy in place, it has taken a toll on teammates that rely on that extra money, and without it there have been hardships outside of work due to the struggles of not being able to pick up the overtime.

HCW341, HCT

PTO [Paid Time Off] is of great benefit to refresh, renew, and recharge! Having additional time away from work is really good for mind, body, and spirit!

HCW831, APP

I have heard from friends that work in other essential roles (not health care) that they are receiving perks from their employers such as gift cards and extra pay per hour. I truly believe that we should also be getting paid extra hourly. Yes, we chose this career path for ourselves, but we also put a lot on the line daily and take a lot of risks that could not only affect us but our families.

HCW523, HCT

6.3 | Organizational factors

Nineteen percent of responses reflected Organizational Factors. The responses of study participants around organizational factors were varied with both praise and criticism of their relevant workplaces. Some clinicians expressed appreciation for how their organization managed the pandemic. Many acknowledged that their healthcare system had responded as well as possible under difficult and abnormal circumstances. A number of participants noted that they were proud to be associated with their organization. In contrast, some clinicians expressed criticism of their organization including concerns over the culture and priorities. Others voiced concern that key decision makers were too far removed from the bedside. Some voiced feelings of not being adequately appreciated and recognized.

"I feel that [name of health care organization] has gone above and beyond to offer providers resources for resilience, mental and emotional help, especially when compared to friends/co-workers in other hospital systems."

HCW2385, APP

[Name of health care organization] clearly does not care about the wellbeing of its employees/ nursing staff. There are not enough nurses, and I am faced to take 6+ patients in a shift. I have had several direct exposures and [employee] health drags their feet to take action.

HCW2511, Nurse

Several participants provided comments and suggestions on how the organization could better assist their employees with self-care and support their mental health. Many of these suggestions focused on improving insurance coverage for therapy and counselling costs. Other responses were focused on practical ways to better support HCWs such as providing mental health advocates, offering breaks in patient care assignments after the loss of a patient or especially difficult experiences in caring for patients, and ensuring that the culture is supportive of mental health at all levels.

Would be helpful to have coverage for therapy. Many coworkers' friends have not gone and

needed to because we have to pay the full price with our insurance which is generally \$150/session and even if you save up HSA [healthcare savings account] that's too much. People go without it and really need it.

HCW247, APP

Additional action items to consider might be partnering more with faith-based community organizations as possible. Allowing for and staffing for "resilience recharges" during the course of a clinical day. Acknowledging that our [employees] need to grieve after a patient loss, instead of immediately going to the next crisis or taking on another assignment. Mandating leaders have resilience training to help support [employees] at all levels. Promote and support teammates to develop a resilience process unique to their unit/work environment making this work a priority in each unit and measuring related outcomes such as attrition, teammate satisfaction, patient satisfaction."

HCW850, APP

6.4 | Personal factors

Fifteen percent of participant responses reflected Personal Factors. Many HCWs had responsibilities related to childcare needs, parenting and homeschooling or assisting with virtual education. For many with additional responsibilities at home, integrating personal and professional demands were challenging while also navigating changes due to the pandemic. At-risk family members were an additional concern that participants noted.

In addition to the COVID-19 pandemic challenges, there have been many things occurring in my personal life requiring me to care for multiple members of my family while continuing to work. This has led to little time to myself to process and deal with my emotions. I think that my personal life has had more of an impact on my emotional health than work.

HCW674, Nurse

Several HCWs voiced their personal experiences of increased stress and anxiety, sleep difficulties, panic attacks and emotional exhaustion during the pandemic. Some shared coping strategies that helped them better manage stress, such as maintaining boundaries and learning from peers. However, several others voiced a need for improved access to counselling or therapy for mental and emotional support. One participant admitted feeling reluctant to use available resources due to concerns of appearing 'weak' while others described cost as barrier to use of supportive services.

"I have trouble with anxiety the evening prior to coming to work and difficulty sleeping on those nights but otherwise I have been fine."

HCW587, Nurse

"I am reluctant to use the [organization's support services] because I feel like I should be able to handle things and it may be thought of as weak. I am overwhelmed by the COVID-19 changes, George Floyd's death and aftermath and personal issues at home."

HCW871, Nurse

6.5 | Society and culture

Five percent of responses reflected the Society and Culture Factor of the NAM model. HCWs' responses suggested the important influence of the media on their well-being and resilience. Several voiced annoyances with the media for how they covered the pandemic. Others voiced frustrations with the media for spreading what they perceived to be inconsistent and inaccurate information.

The media, miscommunication, and over-reaction of some has unnecessarily made a challenging situation even worse, which unfortunately I believe has been the biggest problem of all.

HCW2088, Nurse

The influence of the local community response to the COVID-19 pandemic was another aspect of society and cultural factors that affected HCWs. Several participants expressed appreciation for the unity and support received from the community. At the same time, others expressed frustration with the public's response to the pandemic, and some felt stigmatized by their community due to their close proximity to COVID-19 in caring for infected patients.

"I am so thankful and touched by the support and outpouring of love that has been provided by the community during this time."

HCW1215, Nurse

"One thing this survey doesn't necessarily address is the negative commentary from the public surrounding [COVID] and the medical profession. I have relatives who are now literally afraid of me, fearful they will get [COVID] if I am in the same room with them. (I've never tested positive for [COVID].)"

HCW1462, Nurse

Another important finding was the influence of larger societal and cultural factors. The study was conducted during a period of

political conflict and wide-spread national protests following the death of George Floyd. The responses of several participants demonstrated that current national events at the time had a significant effect on well-being.

The civil unrest is also creating stress among HCWs.
HCW1417, Nurse

Not to take way from the current COVID pandemic. But I think it is important to offer similar advice and resources regarding the racial injustice that is being currently addressed around the country.
HCW113, APP

[Well-being] is a problem in health care that has only been exacerbated by COVID-19, and now the unrest in our society.
HCW850, APP

6.6 | Healthcare responsibilities

Four percent of participant responses reflected the factor of healthcare responsibilities. HCWs were influenced by changes in their healthcare responsibilities due to the pandemic. Some participants indicated they had additional responsibilities beyond their typical obligations. They indicated that the burden of these new or additional responsibilities introduced further stress. There were also some respondents who felt they did not have sufficient time to complete clinical responsibilities, and some indicated that additional cleaning requirements and the use of PPE reduced available time to complete clinical duties and spend time with patients.

"So many more tasks needed now than pre-[COVID]. [I] work in [a] very busy [specialty type] clinic. Workload has increased tremendously. We are doing it, but it's tough!"
HCW582, Nurse

We have no added time for PPE and room cleaning. Patients back-to-back every 20 min! Then a PUI [Person Under Investigation] is seen ... and chaos ensues. No one can function due to worry but we still have 5 people left to see!! Too much, too stressful.
HCW448, APP

Along with additional responsibilities and limited time, HCWs also indicated that they faced more complex and challenging healthcare responsibilities. Participants remarked that the acuity of their patients added stress to their jobs. Some HCWs also commented that patients exhibited greater than typical stress, which in turn made caring for these patients more challenging for HCWs.

[We] are getting higher acuity patients because they are PUI [Person Under Investigation] or COVID+ and it's NOT [our] normal types of patients. As a RN this is extremely concerning to me and my license and I often feel burned out, overwhelmed or in fear of missing something with higher acuity patients. . . I feel like every day is a bad shift/ I'm constantly crying after work which is making me consider new work.
HCW2747, Nurse

Patients stress levels have been higher which in turn gets off loaded to staff.
HCW2747, Nurse

6.7 | Skills and abilities

Less than 1% of responses reflected the factor of Skills and Abilities. Clinical skills and clinical experience influenced the ability of HCWs to cope with challenges during the COVID-19 pandemic. Redeployment, which was used to shift HCWs from areas of low census to areas of highest need, was cited by participants as an added stress during the pandemic.

Being redeployed to an area that I have not practiced in my 14-year nursing career is very stressful and makes me scared for the patients and nervous about losing my license. I feel especially sad for the new nurses who only have practiced [specialty area] and are sent to units they are unfamiliar with.
HCW2444, Nurse

7 | DISCUSSION

This study identified factors associated with well-being and resilience among HCWs during the COVID-19 pandemic. To our knowledge, this study is the first to comprehensively examine this phenomenon using the *NAM Model for Factors Affecting Clinician Well-being and Resilience* as an organizing framework. The results of this study demonstrate the practical usefulness of the NAM model to illustrate factors that may contribute to well-being among HCWs. Participant responses reflected each category of the model. Most responses focused on external factors from the NAM Model (e.g. factors in the healthcare organization); in contrast, fewer responses focused on internal factors specific to individual concerns. These findings support past conceptualizations of burn-out and professional well-being as an occupational phenomenon as well as research findings that demonstrate the significant influence of the healthcare work environment and other organizational factors on well-being and resilience (Brigham et al., 2018; Munn et al., 2021; Schlak et al., 2021; Shah et al., 2021; World Health Organization, 2019).

Most responses by HCWs in this study were reflected in two factors of the NAM model, the learning/practice environment (52%) and rules and regulations (48%). These results demonstrate the significance of the healthcare work environment to the well-being and resilience of clinicians during COVID-19, a finding echoed by several qualitative studies conducted during the pandemic. These studies, conducted in diverse global settings, are consistent with our findings, that demonstrate the critical relationship of the work environment to the well-being and resilience of clinicians, including insufficient equipment (e.g. PPE), lack of standardized guidelines, increased workload, limited organizational support and overall worker burnout and exhaustion (Arnetz et al., 2020; Joo & Liu, 2021; Jun & Rosemberg, 2021; Koontalay et al., 2021). These findings are also consistent with quantitative studies conducted during the pandemic, which reveal perceptions of higher nurse-to-patient ratios (Bruyneel et al., 2021), perceptions of increased workload (Galanis et al., 2021; Munn et al., 2021) and perceptions of inadequate PPE or other material supplies (Galanis et al., 2021; Munn et al., 2021) are associated with significantly higher levels of burnout or at-risk well-being.

To prioritize the well-being and resilience of HCWs, organizational leaders must focus on creating a healthy work environment. Practically, this might begin with assessment of clinician well-being across the healthcare organization, since it is difficult to improve what remains unknown (Sinsky et al., 2020). Once healthcare leaders understand the baseline well-being of the healthcare workforce, evidence-based solutions can be created to address issues in the practice environment. The National Academy of Medicine has created a *Resource Compendium for Health Care Worker Well-Being* to assist health system leaders with strategies and tools to decrease clinician burnout and promote well-being (www.nam.edu/compendium-of-key-resources-for-improving-clinician-well-being/).

Study findings also help to illustrate how policies enacted within an organization may have a downstream effect on the work environment, which in turn affects the well-being of HCWs. For example policies to limit visitation during COVID-19 unintentionally added to the already significant workload of HCWs because family and friends of the patients were not there to support their loved ones. Thus, clinicians were left with a particularly large burden of providing supplemental emotional support to patients in addition to the clinical components of care delivery and other work demands. This illustrates the need for leaders to thoughtfully consider the unintended consequences of actions and identify strategies to mitigate undesirable effects. In their discussion paper of organizational practices to improve clinician well-being, Sinsky et al. (2020) discuss how organizational policies can divert clinician time and attention away from clinical care, serving as a source of frustration and burnout. They suggest that organizations periodically evaluate the policies and practices and eliminate those with unintended consequences (Sinsky et al., 2020).

Participants described how personal factors during the pandemic affected their well-being and resilience. Struggles with their personal mental health, navigating virtual or online learning for school-aged children, juggling caregiving responsibilities and dealing

with their own fear of transmitting COVID-19 to high-risk family members were concerns that participants discussed. In a study of burnout among HCWs in the United Kingdom during the pandemic, researchers found significantly higher rates of moderate to severe burnout among females and individuals under 40 years of age (Ferry et al., 2021), which may be explained in part by added caregiving responsibilities. The researchers also found that individuals with moderate to severe burnout were four times more likely to have a previous history of mental illness (i.e. depression). Previous research has also demonstrated that work-family conflict is a significant predictor of burnout (Cotel et al., 2021; Galletta et al., 2019). Cumulatively, these findings demonstrate that personal factors meaningfully contribute to the overall well-being of HCWs and suggest that healthcare systems must ensure adequate support measures are in place such as Employee Assistance Programs and provisions for mental health services. However, the availability of these resources may not be sufficient alone. Effective communications on how to access these resources as well as normalization of use by leaders and peers may be just as important. Peer support programs have also received wide-spread attention during the COVID-19 pandemic, but more research is needed to evaluate the impact of peer support on burnout and resilience (Connors et al., 2020). Results of this study also highlight the added caregiver burden that some HCWs face. More research is needed to explore the extent to which caregiver responsibilities (i.e. children, ageing parents, high medical need relatives) impact the healthcare workforce.

Participants also described how societal and cultural influences in the larger environment impacted their well-being and resilience. Some participants were bothered by the media coverage of the pandemic and described how miscommunication and inaccuracies further increased stress. A study of primary healthcare nurses' perceptions of risk during COVID-19, conducted in Australia, similarly described frustration and even anger with the perceived relationship between media coverage of the pandemic and increased anxiety among patients (Ashley et al., 2021). Study participants also discussed the murder of George Floyd and national protests regarding racial inequity in the United States that followed his death, and how these events added additional stress. These findings illustrate that macrolevel forces impact workers as well as highlight the need for societal interventions and public policies to enhance societal well-being (Schwartz et al., 2020).

As a whole, the findings from this study indicate a critical need for interventions that accurately reflect and address the complexity of factors that impact clinicians. While individual-level interventions to decrease burnout and bolster personal resilience are important, there has been a relative neglect of interventions primarily focused on the healthcare teams, the healthcare organization and the broader environmental factors that contribute to the overall well-being of the healthcare workforce. Thus, this study underscores the need for future research that examines well-being and resilience at multiple levels so that better, evidence-informed interventions can be developed and tested. Individual-level interventions have often shown improvement in burnout scores among

physicians, but organization-level interventions have an equal if not greater effect on burnout and stress as individual or person-centred intervention (Stehman et al., 2020). This study demonstrates the importance of expanding studies to interventions that target organizational factors.

7.1 | Limitations

While we collected rich responses from HCWs, there were limitations to the present study. Because the study employed an anonymous survey to collect data, we were unable to validate findings with study participants through member checking or other means. Additionally, data were collected with a single, open-ended question as part of a larger survey study, a method similarly adopted in other studies of HCWs during the pandemic (Arnetz et al., 2020). However, a greater depth of understanding might be obtained from individual interviews or focus group discussions, which some researchers have achieved by asking survey study participants to indicate their willingness to be contacted for interview (Ashley et al., 2021). Another limitation of the study is the generalizability of findings. The study was conducted during the COVID-19 pandemic, and it was conducted in the United States. As such, this limits the transfer of results beyond the pandemic and may additionally limit the application to other countries and cultures.

8 | CONCLUSION

This study used the National Academy of Medicine model of factors affecting well-being and resilience to explore the experience of HCWs during the COVID-19 pandemic. The findings of this study demonstrate the utility of the NAM model to understand and explain well-being and resilience in this population. The results of this study also illustrate the complex nature of well-being in HCWs, who were impacted by multiple factors and on several levels. This research provides important information to healthcare leaders that may assist in the development of strategies to better support the well-being of HCWs for the remainder of the COVID-19 pandemic, as well as other healthcare crises that may arise in the future. The study also emphasizes the need for future research that better reflects the complexity of this phenomenon to address the myriad factors more meaningfully.

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CONFLICT OF INTEREST

The authors do not have any conflict of interest to report.

AUTHOR CONTRIBUTIONS

LTM, CSM, CDC, MS, SCD, MAG: Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data. LTM, CSM, CDC, MS, SCD, MAG: Involved in drafting the manuscript or revising it critically for important intellectual content. LTM, CSM, CDC, MS, SCD, MAG: Gave final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content. LTM, CSM, CDC, MS, SCD, MAG: Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

PEER REVIEW

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DATA AVAILABILITY STATEMENT

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

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