

An Exploration of Resilience and Burnout among Healthcare Workers in the United States

by

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Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor
of Philosophy in the School of Nursing in the Graduate School
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ABSTRACT

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Abstract

Healthcare workers (HCW) have historically suffered from high rates of burnout, and these rates have continued to rise during the pandemic (Sexton et al., 2022). Burnout among healthcare workers carries significant consequences for both HCWs (Davidson et al., 2018; Stathopoulou et al., 2011) and patients (Schlak et al., 2021). National organizations have focused their attention on this issue of improving HCW well-being. Greater clarity is needed to understand how best to optimize HCW well-being and to address the challenges of HCW burnout.

The purpose of this dissertation was to generate knowledge on HCW burnout and resilience. Specifically, this dissertation used existing data from the Web-based Implementation of the Science for Enhancing Resilience (WISER) data set and encompasses three studies whose purposes were: (1) to describe the stressors that HCWs experience using a summative content analysis to determine the types and total numbers of stressors; (2) to identify subgroups of nurses with distinct profiles of well-being using a latent profile analysis to identify profiles of burnout (emotional exhaustion) and resilience (emotional thriving and emotional recovery); bivariate statistics were used to identify profile differences in nurse characteristics; and (3) to identify types of well-being behaviors and the total number of well-being behaviors associated with resilience among HCWs. Bivariate statistics were used to identify the

relationship of each type of well-being behavior with emotional thriving and emotional recovery, and to identify the total number of well-being behaviors with emotional thriving and emotional recovery. General Linear Models using analysis of covariance was used to examine the relationships between the well-being behaviors and the total number of well-being behaviors, respectively, with emotional thriving and emotional recovery, after adjusting for covariates.

The main findings of this dissertation included those regarding stressors, the co-occurrence of burnout and resilience, and findings related to well-being behaviors. First, stressors are experienced in HCWs' work, personal life, and in ways that intersect both work and personal life. Second, we found that nurses experienced a combination of burnout (emotional exhaustion) and resilience (emotional thriving and emotional recovery) in four distinct profiles of "exhausted," "exhausted with thriving," "exhausted with thriving and recovery," and "thriving and recovery." Each profile was associated with unique nurse characteristics. Finally, we found that the well-being behaviors of exercise, yoga, meditation, spending time with a close friend, and going on a vacation were all significantly associated with greater emotional thriving while only exercise, and spending time with a close friend were significantly associated with greater emotional recovery (Rink et al., 2021).

Findings from this dissertation will inform the development and testing of interventions to reduce burnout and strengthen resilience for HCWs. Specifically,

understanding the full breadth of stressors experienced by HCWs can inform the strategies used in interventions to address stress and burnout among HCWs.

Additionally, this dissertation identified the co-occurrence of burnout and resilience that extend beyond the previously known dichotomous relationship and underscored the importance of increasing resilience. Finally, findings also can inform future work on enhancing HCW resilience through well-being behaviors.

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Chapter 1. Introduction

Healthcare worker (HCW) burnout has reached critical levels, with nurses experiencing rates at 49% (American Nurses Foundation [ANF], 2022; Sexton et al., 2022), physicians at nearly 40% (Sexton et al., 2022), and other HCWs inclusive of pharmacists, technicians, respiratory therapists, and various other clinicians at 35% or more (Sexton et al., 2022) of at least one of the major components of burnout.

Importantly, burnout is a barrier to providing high quality patient care while also having negative implications for HCW well-being (ANF, 2022; National Academies of Sciences, Engineering, and Medicine [NASEM], 2021; NASEM, 2019). Burnout is defined as prolonged stress in the workplace that results in emotional exhaustion, feelings of depersonalization, and reduced personal accomplishment (Maslach & Leiter, 2016; World Health Organization [WHO], 2022). Alternatively, resilience is defined as a process that is initiated through adversity or a challenge, which results in positive adaptation (Cooper et al., 2020; Masten, 2014). An understanding of both burnout and resilience is necessary to clarify potential solutions for promoting HCW well-being.

Burnout among HCWs has negative implications for HCWs' well-being (Mealer et al., 2009; Stathopoulou et al., 2011). HCWs face high rates of psychosocial distress, evidenced by higher rates of suicide found in a study of HCWs in San Diego, California (Davidson et al., 2018). Studies of nurses (Chin et al., 2019) and medical students

(Dyrbye et al., 2008) have identified a relationship between burnout and greater suicidal ideation. HCW burnout is also related to poor patient outcomes (Aiken et al., 2002; Cimiotti et al., 2012; McHugh et al., 2011; Melnyk et al., 2018; Schlak et al., 2021). For patients, the consequences of being cared for by HCWs experiencing burnout are increased healthcare associated infections (Cimiotti et al., 2012), lower patient satisfaction (McHugh et al., 2011), increased medical errors (Melnyk et al., 2018), and increased patient mortality (Aiken et al., 2002; Schlak et al., 2021).

This dissertation will focus on burnout and resilience in HCWs, including (1) an assessment of stressors HCWs experience, since prolonged stress is considered a predecessor of burnout (Williams et al., 2007); (2) how burnout and resilience may co-occur; and (3) the association of well-being behaviors and resilience. This introductory chapter begins with an overview of the conceptualization of burnout, followed by factors associated with burnout, and effects of burnout. Next, this chapter will provide a conceptual review of resilience, factors related to HCW resilience, and a discussion of the relationship between resilience and burnout. Interventions that seek to reduce burnout and/or increase resilience will then be summarized, including a discussion of individual- versus systems-level approaches to burnout. The overarching conceptual model for this dissertation, the Clinician Burnout and Professional Well-being Model from the National Academy of Medicine Model (NASEM, 2019) will be reviewed,

followed by gaps in the literature regarding how to address burnout and resilience.

Finally, a description of the subsequent chapters of this dissertation will be delineated.

1.1 Conceptual Overview of Burnout

The inclusion of burnout in the International Classification of Diseases (ICD-11) signals the growing focus and understanding of this work-related condition (WHO, 2019). Burnout is defined in terms of its antecedent which includes prolonged and unmitigated stress in the workplace (WHO, 2022). One classical definition of stress is offered by Lazarus and Folkman (1984) as "a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (p.21). The consequences of burnout include the three dimensions of emotional exhaustion, depersonalization, and reduced personal accomplishment (WHO, 2022). These consequences make up the three main subscales in the Maslach Burnout Inventory, which is considered the gold standard for measuring burnout among HCWs (Dyrbye et al., 2017; NASEM, 2019). This dissertation will use the World Health Organization's definition for burnout:

"...a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions: feelings of energy depletion or exhaustion, increased mental distance from one's

job, or feelings of negativism or cynicism related to one's job; and reduced professional efficacy (WHO, 2019, para 4)."

Emotional exhaustion is described as feeling worn out and depleted; cynicism is synonymous with either a negative or disconnected attitude to work in general and the people at work (Maslach & Leiter, 2016). Reduced professional efficacy encompasses a lack of feeling competent or contributing at work (Maslach & Leiter, 2016). The Job Demands-Resource Model (Demerouti et al., 2001) provides additional contextual understanding for the phenomenon of burnout. This model conceptualizes burnout as resulting from an imbalance of job demands and resources, namely high demands and low resources that are related to exhaustion and depersonalization, respectively (Demerouti et al., 2001). Job demands are defined as any work-related requisite that expends the energy of the HCW (Bakker & Demerouti, 2017), such as physician patient load, nurse-patient ratio, and documentation requirements in the electronic health record (NASEM, 2019). Job resources are positively oriented to include any work-related facet that, instead of expending energy, can work to foster personal and professional potential (Demerouti et al., 2001). Examples of job resources for HCWs are an organizational culture that values teamwork, positive relationships with coworkers, and a schedule that facilitates work-life integration (NASEM, 2019). Personal resources facilitate a person's ability to manage their own outcomes (Baker & Demerouti, 2017).

Examples of personal resources are optimism and self-efficacy (Baker & Demerouti, 2017). Job and personal resources can ease the strain of job demands that result in burnout (Bakker & Demerouti, 2014), which is important given the multitude of job demands in the healthcare setting and slow pace at which these demands can be reduced or modified.

1.2 Current Trends and Issues in HCW Burnout

1.2.1 Factors Related to Burnout

The contributors to burnout among HCWs are well documented in the literature. Burnout contributors include those at the individual-level such as sociodemographic factors and those relating to the work-system, such as workload (NASEM, 2019). Individual-level HCW characteristics of race/ethnicity (Dyrbye et al., 2007; Garcia et al., 2020), sex (Templeton et al., 2019; Walsh, 2013), and age (Adriaenssens et al., 2015; Pradas-Hernández et al., 2018; Shanafelt et al., 2009; West et al., 2018) have been shown to be related to burnout. More specifically, scant research is available on differences in HCW burnout by race and ethnicity (Dyrbye et al., 2017); however, a recent study found the lowest odds of burnout was in non-Hispanic Black HCWs followed by non-Hispanic Asian, and Hispanic/Latinx HCWs compared to non-Hispanic White HCWs (Garcia et al., 2020). Similarly, racial/ethnic minority medical students have reported lower rates of burnout compared to non-minority students; however, minority students who reported

issues such as discrimination in the educational environment were more likely to have higher levels of burnout compared to minority students without these experiences (Dyrbye et al., 2007).

Studies on the association between HCW sex and burnout found females reported higher rates of burnout than males (Templeton, 2012). Additionally, a meta-analysis assessing a wide range of occupations, including healthcare, found that sex relates uniquely to different domains of burnout, demonstrating that females were more prone to emotional exhaustion and males to depersonalization (Purvanova & Muros, 2010). Research further suggests a more complex relationship between HCW sex and burnout when additional factors are included in the analysis (Templeton et al., 2019; Walsh, 2013). For example, having support from management is a greater protective factor against burnout in males than females, while social support from peers is a greater protective factor against burnout in females than males (Walsh, 2013).

Studies on the association between HCW age and burnout found older physicians had lower burnout compared to younger physicians (Shanafelt et al., 2009; West et al., 2018). Comparable findings related to age were reported in systematic reviews of nurse burnout, with older nurses reporting lower rates of burnout compared to younger nurses (Adriaenssens et al., 2015; Pradas-Hernandez et al., 2018). However, the association between HCW age and burnout could be related to attrition of HCWs.

For instance, nearly 50% of hospital nurses who left their position did so with two years or less of service (Nursing Solutions Inc., 2022). Conversely, HCWs with greater resilience may stay longer in their career.

Professional factors include practice setting (McHugh et al., 2011) and HCW role (Sexton et al., 2022; Shanafelt et al., 2022). Work-system factors encompasses job demands, including issues largely outside of the HCW's control such as workload, administrative requirements, inefficient workflow, and electronic medical record use (NASEM, 2019). Regarding HCW professional characteristics, the prevalence of burnout varies by type of HCW role, with nurses (49%) (ANF, 2022; Sexton et al., 2022), physicians (34.4%-40.1%) (Sexton et al., 2022), therapists including physical, occupational, speech, and various therapists including respiratory, physical, occupational, and speech therapists (39.1%), pharmacists (41.9%), and technicians such as radiology or pharmacy technicians (42.1%) (Sexton et al., 2022) reporting different rates of burnout. Practice setting also plays a role in burnout rates among nurses (McHugh et al., 2011). Nurses who practice in the hospital or nursing home settings have higher rates of burnout compared to other settings (settings not specified by authors) (McHugh et al., 2011). Providing direct patient care adds another element of burnout risk for nurses in these settings, with higher rates of nurses who provide direct patient care reporting burnout compared to nurses who do not (McHugh et al., 2011).

For physicians, a study examining the prevalence of burnout over time by practice area consistently demonstrated that burnout is higher in specialties such as emergency medicine and obstetrics and gynecology and lower in psychiatry and preventative and occupational medicine (Shanafelt et al., 2019).

Work-system factors of burnout are influenced by the variables at the organizational- or system-level and are largely beyond an individual's control. More specifically, work-system factors associated with higher levels of burnout include increased workloads (Aiken et al., 2002; Oskrochi et al., 2016), higher patient to nurse staffing ratios (Rafferty et al., 2007); longer work schedules (Amofo et al., 2015; Dyrbye et al., 2013), and use of electronic health record documentation or computerized physician order entry (Shanafelt et al., 2016). Other work-system factors related to burnout are administrative burdens such as prior authorization, documentation in the ambulatory clinical environment, and medication reconciliation among physicians (Rao et al., 2017). Policy organizations such as the American Nurses Foundation (ANF, 2022) and National Academy of Medicine (NAESM, 2019; NAESM, 2022) are leading the charge to address HCW burnout and suggest that work-system are the predominant driver of burnout (NASEM, 2019). A meta-analysis of controlled burnout intervention for physicians found a significantly larger reduction in burnout with larger effect sizes

among interventions designed to address work-system drivers of burnout in comparison to interventions designed to address the individual-level (Panagioti et al., 2017).

1.2.2 Effect of HCW Burnout

While many studies emphasize the impacts of burnout on patient care, others have focused on the personal suffering experienced HCWs (Dyrbye et al., 2017; Schechter et al., 2020). Research has shown an association between higher rates of emotional exhaustion, a key component of burnout, and higher rates of anxiety and depression in nurses among a sample of emergency department nurses in Greece (Stathopoulou et al., 2011). The personal effects of burnout have been intensified by the recent COVID-19 pandemic (Hu et al., 2020). A study of 2,014 nurses working in Wuhan, China during the COVID-19 pandemic reported emotional exhaustion rates at 60% and depression and anxiety at nearly 45% (Hu et al., 2020). Similarly, researchers found that psychological distress is at a critical level among a sample of 657 HCWs in New York City during the COVID-19 pandemic, with acute stress at 57%, depression at 48%, and anxiety at 33% (Schechter et al., 2020). Thus, with rates of burnout at historically high levels, HCW suffering is amplified while caring for patients during the ongoing pandemic.

Patient care is compromised when HCWs experience burnout, ranging in significance from lower patient satisfaction (McHugh et al., 2011) to more life-threatening issues (Aiken et al., 2002; Cimiotti et al., 2012; Schlak et al., 2021). For

instance, hospital-acquired infections, such as hospital urinary tract infections and surgical site infections, are more prevalent in practice settings with increased rates of nurse burnout (Cimiotti et al., 2012). Researchers determined that reducing burnout by 30% could translate to a reduction of over 6,000 hospital-acquired infections (Cimiotti et al., 2012). The most significant effects of burnout can be seen in higher patient mortality or failure to rescue rates, demonstrated in settings with nurses who had higher rates of burnout (Schlak et al., 2021).

Burnout among HCWs also causes significant financial strain on the healthcare system. When HCWs experience burnout, they are more likely to consider leaving their position, thus leading to higher rates of turnover (NAESM, 2019). An exemplar of the ramifications of high rates of turnover can be seen among nurses. The rates of turnover for staff nurses are 27.1% (Nursing Solutions Inc., 2022). Just over 31% of nurses reported burnout as a factor in their decision to resign (Shah et al., 2021). Replacing one hospital nurse costs approximately \$46,100 (Nursing Solutions Inc. 2022). Models that assess the cost of physician turnover and reduced work effect (e.g., fewer hours) related to burnout are estimated to be over \$4 billion nationwide (Han et al., 2019). Thus, the cost of burnout extends beyond patients and HCWs, negatively impacting the financial health of healthcare organizations. These far-reaching effects of burnout present an opportunity to explore accessible solutions aimed at improving HCW well-being.

1.3 Conceptual Overview of Resilience

The capacity for resilience is present in all human beings (Masten, 2014) and is modifiable in that it can be strengthened (Szanton & Gill, 2010). Research suggests positively- framed approaches, inclusive of those designed to increase resilience among HCWs, have shown benefits such as lower rates of burnout (Adair et al., 2020; Guo et al., 2018; K. Rehder et al., 2021; Sexton, et al., 2022). In one description of the pathophysiology of burnout, a team of researchers likened burnout to a microbiologic disease process with the analogy, “burnout is the disease, the environment is the pathogen, and an individual’s resilience is the immune system” (Rehder et al., 2021, p. 1098). This parallel points to the potential for resilience to serve as a buffer to the work-system drivers of burnout. Similarly, a concept analysis found that nurses with resilience also had self-efficacy, social support, optimism, a favorable work-life balance, and self-care which results in protecting the nurse from psychological challenges including burnout (Cooper et al., 2020).

Resilience research originated in the child development literature (Masten, 2014) and is currently receiving national attention as a component of clinician well-being in the presence of burnout (NASEM, 2019). This dissertation will consider resilience as a process (APA, 2020; Cooper et al., 2020; Masten & Narayan, 2012; Masten, 2014) that is modifiable at the individual level (Fredrickson, 2004; Fredrickson, 2013; Lyubomirsky &

Della Porta, 2010) and across multiple levels ranging from the cellular level to the larger society (Szanton & Gill, 2010). Scholars across a variety of disciplines have defined resilience, (Table 1) concluding that core components of resilience should include the presence of a challenge or adversity that precedes a process resulting in positive adaptation.

Table 1 *Resilience Definitions*

Authors, Discipline of Authors	Definition	Core Components
Cooper, A. L., Brown, J. A., Rees, C. S., & Leslie, G. D. Nursing	"A complex and dynamic process which when present and sustained enables nurses to positively adapt to workplace stressors, avoid psychological harm and continue to provide safe, high-quality patient care" (Cooper et al., 2020, p. 15).	<ul style="list-style-type: none"> • Process oriented • Positive adaptation • Avoidance of psychological harm • Supportive of providing good patient care
Szanton, S.L. & Gill, J.M. Nursing	"Resilience is resistance, recovery, or rebound of mental and physical health after a challenge" (Szanton & Gill, 2010, p. 329).	<ul style="list-style-type: none"> • Challenge • Resistance, recovery, rebound
Masten, A. S. Child Development	"The capacity of a dynamic system to adapt successfully to disturbances that threaten system function, viability, or development" (Masten, 2014, p.10).	<ul style="list-style-type: none"> • Disturbances • Adaptation • Dynamic capacity
Panter-Brick, C. Anthropology	"A process to harness resources in order to sustain well-being" (Southwick et al., 2014, p. 5).	<ul style="list-style-type: none"> • Process oriented • Harnessing resources • Sustaining well-being
Zautra, A. J., Hall, J.S., & Murray, K. E. Social psychology, public policy, psychology	"An outcome of successful adaptation to adversity, and is revealed by sustainability, recovery, or both" Zautra, et al., 2010 p. 9).	<ul style="list-style-type: none"> • Resilience as an outcome • Adaptation • When facing adversity • Sustainability and/or recovery
Feder, A., Nestler, E. J., Westphal, M., & Charney, D. S. Psychiatry Neuroscience Medicine Pharmacology	"Resilience is an active process – not just the absence of pathology – that can be promoted by enhancing potentially protective factors" (Feder et al., 2010, p. 47).	<ul style="list-style-type: none"> • Active process • Can be promoted
Ong, A. D., Bergeman, C. S., & Chow, S. M. Human Ecology Psychology	"A pattern of functioning indicative of 'positive adaptation' in the context of 'risk' or adversity" (Ong et al., 2010, p.81).	<ul style="list-style-type: none"> • When facing adversity • Positive adaptation
Lyubomirsky, S. & Della Porta, M.D. Psychology	"In the event of a stressful experience, resilience is the mechanism that allows a person to cope with and recover from the harmful effects of negative emotional appraisals that often accompany stress" (Lyubomirsky & Della Porta, 2010, p. 456).	<ul style="list-style-type: none"> • Setting of stress • Resilience as a mechanism • Coping • Recovery

Emotional recovery and emotional thriving make up the primary components of resilience (Szanton & Gill, 2010). Emotional recovery occurs when the person is able to bounce back to their initial baseline after encountering a challenge and experiencing a setback (Szanton & Gill, 2010). Emotional thriving is characterized as exceeding or growing beyond one's former baseline after encountering a challenge (Szanton & Gill, 2010). Positive emotions are viewed as the fuel for these two resilience processes (Tugade & Fredrickson, 2004). Thus, emotional recovery and emotional thriving are the primary concepts of resilience in this dissertation.

1.3.1 Resilience in HCWs

Like the resilience definitions indicated above, (Masten, 2014; Southwick et al., 2014), a concept analysis of nurse resilience identified the antecedent of resilience to be adversity (Cooper et al., 2020). Similarly, meeting a challenge or adversity was described as a key component to growing in resilience among physician residents (Winkel et al., 2018). The outcome of resilience includes, "prevention of negative psychological outcomes, increased job satisfaction, remaining in the workforce and increased quality of patient care" (Cooper et al., 2020, p. 15) and fewer feelings of overwhelm when faced with stressors (Winkel et al., 2018). Additionally, nurse resilience attributes include optimism and humor, yet also a sense of realism along with having support from family and friends, self-efficacy, caring for ones' self, and having balance in work (Cooper et al.,

2020). These attributes are conceptualized as the drivers of adaptation and recovery in the face of adversity for nurses (Cooper et al., 2020). Similar findings on the concept of resilience have been reported in a variety of HCWs including the attributes of optimism and humor (Matheson et al., 2016). Additional consequences of HCW resilience include being flexible and adapting when facing a challenge (Matheson et al., 2016). Thus, resilience in HCWs have attributes and consequences that can likely be beneficial for those working in challenging healthcare settings.

1.4 Current Trends and Issues in Resilience

1.4.1 Factors Related to HCW Resilience

Individual sociodemographic and professional characteristics of HCWs relate to resilience, albeit with conflicting findings (McKinley et al., 2019; Yu et al., 2019). Research on the association between sex and age with HCW resilience is inconclusive with studies finding both a statistically significant and a non-statistically significant relationship between sex or age with nurse resilience (Yu et al., 2019). Similarly, research findings on the association between HCWs' overall professional experience and resilience is conflicting with studies showing a positive relationship between professional experience and resilience (Sánchez-Zaballos & Mosteiro-Díaz, 2021) and no relationship between years of work experience and resilience in other studies (Ren et al., 2018). More research is needed to resolve these conflicting findings of the relationship

between HCWs' individual sociodemographic and professional characteristics and resilience.

Resilience is more consistently associated with work-related factors as demonstrated in a recent systematic review that reported negative associations between resilience and stress, burnout, fatigue, anxiety and depression, and workplace bullying (Yu et al., 2019). Alternatively, more positively framed factors such as job satisfaction, coping skills, social support, self-efficacy, job retention, and general well-being were noted as having positive associations with resilience (Yu et al., 2019). Finally, the work-system factor of lower workload was positively associated with resilience (McKinley et al., 2019), while association between shift work and resilience has yielded mixed findings (Yu et al., 2019). In sum, these inconclusive findings of the association of resilience with individual sociodemographic and professional characteristics of HCWs suggest that more research is needed to understand these important relationships.

1.4.2 Resilience and Burnout

Understanding the relationship between resilience and burnout provides the necessary empirical foundation to inform development of interventions that seek to optimize HCWs' levels of both (e.g., high resilience and low burnout). Research has predominantly found that higher levels of resilience are associated with lower levels of burnout (Adair et al., 2020; Guo et al., 2018; Matheson et al., 2016). However, the

relationship between burnout and resilience among HCWs may be more complex than previously described, based on new evidence showing 29% of physicians with the highest levels of self-reported resilience still experience symptoms of burnout (West et al., 2020); however, this same relationship between high resilience and burnout is unknown in nurses.

1.5 Approaches to Reducing HCW Burnout and Increasing Resilience

Interventions designed to reduce burnout or improve well-being can be organized into two categories. The first category is organizational interventions that address the work-system factors that drive burnout such as addressing inefficiencies in workload, workflow, and administrative requirements (NASEM, 2019). Second, are individual-level interventions designed to increase HCW well-being and/or resilience (Kunzler et al., 2020; NASEM, 2019). The National Academy of Medicine's 2019 report on clinician burnout conceptualizes burnout as "a barrier to professional well-being" (NASEM, 2019, p. 273) which is reflected in the studies that present burnout as the problem and increased resilience and well-being as the ideal outcome (Sexton et al., 2022; Kunzler et al., 2020).

Work-systems interventions include those designed to address workload and workflow (NASEM, 2019). Workflow interventions that reduced burnout included those that shifted the task of entering data into the electronic health record to medical

assistants, improved the process of moving patients through the clinic, and provided more time for staff to complete job tasks and for patients to be seen during return visits (Linzer et al., 2015). Other examples of organizational interventions that reduced burnout among HCWs were those that improved the medication reconciliation process (Linzer et al., 2015).

Individual-level interventions aim to improve the well-being of HCWs and often focus on improving positive emotions, which are considered on the opposite end of the continuum from the negative emotions of burnout (Rehder et al., 2021). For instance, one intervention included brief text-based exercises to improve HCW's positive emotions including gratitude, awe, kindness, and the cultivation of relationships. This intervention yielded statistically significant improvements in depression scores after one week, improved work-life integration, happiness, emotional thriving, and emotional recovery while emotional exhaustion improved at one month and all metrics of well-being were sustained at 12 months (Sexton et al., 2022). Individual-level focused interventions are also focused in the cognitive and psychology realms such as cognitive behavioral therapy and mindfulness (Kunzler et al., 2020). However, a Cochrane review of interventions designed to increase resilience found limitations in the quality of studies and noted that most studies were high intensity (Kunzler et al., 2020) which can be a

barrier for busy healthcare workers who do not have time for lengthy in person interventions.

There is growing commentary on the need of organizational interventions versus individual-level interventions (Balme et al., 2015; Cunningham, 2020; Rushton & Pappas, 2020). The National Academy of Medicine's 2019 report, *Taking Action Against Clinician Burnout*, suggests that strategies to address burnout on the system-level are of great importance due to the work-system drivers of burnout that individual-level strategies are not able to change (NAESM, 2019). A systematic review and meta-analysis of interventions with a control group to reduce burnout in physicians supports this notion, as evidenced by findings that showed interventions designed to reduce burnout at the work-system level (e.g., interventions of different workloads and schedules among groups) were significantly more effective than interventions that targeted individual-level strategies (e.g. self-care training) (Panagioti et al., 2017). Greater effectiveness among system level compared to individual-level strategies could be related to a number of possible factors including (a) work-system contributors of burnout are considered a significant source of burnout (NASEM, 2019); and (b) individual-level strategies are effective at improving metrics of well-being (e.g., depression, resilience, and happiness) sooner than changes in burnout are seen (Sexton et al., 2022). However, individual-level strategies remain necessary (NASEM, 2019; West et al., 2016) for two

primary reasons. One reason is that work-system changes (e.g., changes to workload, shift length, and documentation requirements with the electronic medical record) will likely take time to change, and HCWs need relief now. Second, HCW burnout and psychological distress has been compounded as HCWs working during the COVID-19 pandemic (Dzau et al., 2020; Lai et al., 2020; Shechter et al., 2020). Thus, given the urgency of the issue of burnout with HCWs needing relief right away, individual-level solutions are needed in tandem with the predominant work-system drivers.

1.6 Conceptual Framework for the Dissertation

A SYSTEMS MODEL OF CLINICIAN BURNOUT AND PROFESSIONAL WELL-BEING

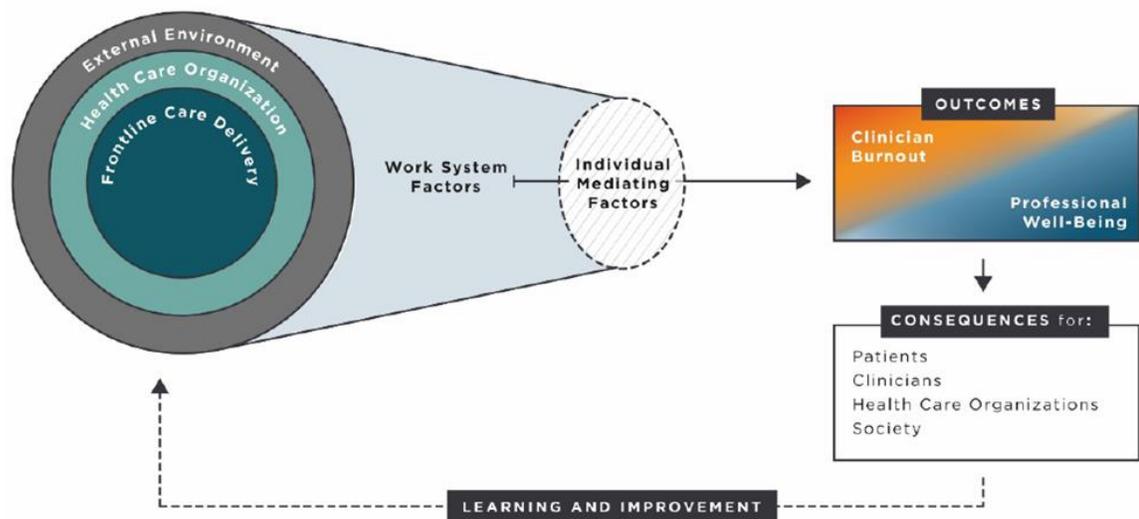


Figure 1: National Academy of Medicine Model: Clinician Burnout and Professional Well-being

The National Academy of Medicine Model for Clinician Burnout and Professional Well-being will be used to guide this dissertation. The model displayed in Figure 1 provides a comprehensive view in identifying the contributors to burnout and includes (a) the larger ecosystem in which HCWs work (e.g. external environment, healthcare organizations, and the interface of HCWs, families, and patients that comprises frontline care delivery); (b) work system factors (e.g. job demands such as heavy workload and administrative burdens and job resources such as having a clear sense of meaning and purpose at work) and (c) individual factors which explicitly name HCW resilience, coping strategies, and social support (NAM, 2019). The model posits that each of the three system levels (e.g. external environment, healthcare organizations, and frontline care delivery) interact with one another and ultimately influence the job demands or job resources work system factors. When these demands and resources are out of balance, the HCW is at higher risk for burnout and lower professional well-being. The individual factors that include a HCW's level of resilience are thought to mediate the work system factors' influence on burnout and well-being. Finally, the consequences of burnout relate to poor patient, HCW, healthcare organization, and societal outcomes. In this model, these consequences are noted by the larger system, which in turn, engages in learning and improvement that feedback into the system to ultimately improve

outcomes. This dissertation will focus on both the individual-level and work-system factors of burnout.

1.7 Gaps in the Literature

The following chapters of this dissertation will address specific components of the gaps identified in the literature including understanding the nature of HCW stress, how burnout and resilience co-occur, and contributors to resilience.

1.7.1 Gaps and Chapter 2

Given that stress is considered a precursor to burnout (Williams, 2007; WHO, 2022), it is important to understand stressors among HCWs. To date, no qualitative study with a large sample of various HCWs has investigated HCWs' perspectives on major recent stressors outside of a certain context such as the pandemic or a particular setting (e.g., the work environment). This lack of knowledge prevents understanding of current causes of stress in the lives of HCWs. This new knowledge is necessary to inform development and testing of interventions aimed at reducing individual-level and system-level stressors among HCWs.

1.7.2 Gaps and Chapter 3

Evidence often points to a dichotomy between resilience and burnout. However, recent evidence has pointed to the possibility that one can have high resilience while being burnt out (West et al., 2020). As a first step to understanding this complex

relationship between resilience and burnout, research is needed to understand whether and how burnout and resilience co-occur.

1.7.3 Gaps and Chapter 4

Resilience is conceptualized as a process that is accessible to all and ultimately able to be strengthened (Masten, 2014). A critical gap in the literature is knowledge on the well-being behaviors HCWs' engage in and their association with resilience. Current research often focuses on certain HCW groups as seen in Lebensohn et al., (2013) and Shanafelt et al., (2012). However, less is known regarding the total number and types of well-being behaviors that HCWs engage in and the association between these behaviors and resilience (Rink et al., 2021). Secondly, there is conflicting or limited research findings on the relationship between sociodemographic and professional variables with resilience such as self-reported gender, type of shift work, (Yu et al., 2019), work setting (e.g., in-patient or out-patient setting) or work experience among HCWs with resilience (Dyrbye et al., 2017). Understanding the association between well-being behaviors and characteristics of HCWs that are associated with resilience is a critical gap that needs to be addressed.

1.8 Purpose Statement and Specific Aims

The purpose of this dissertation is to develop knowledge regarding HCW burnout and resilience by (1) understanding stressors that HCWs encounter; (2)

examining whether and how burnout and resilience co-occur in nurses; and (3) assessing well-being behaviors and their relationship with resilience. This dissertation was conducted using a secondary data analysis of the Web-based Implementation of the Science for Enhancing Resilience (WISER) data set. Findings from this dissertation will inform the development of future interventions with consideration of personalized approaches to reduce burnout and strengthen resilience for HCWs. The following four chapters and their corresponding aims were conducted to address the components of the purpose of this dissertation:

1.8.1 Chapter Two Aims

Chapter two used a qualitative descriptive design with a summative content analysis of the open-ended survey question asking HCWs: *What are your biggest stressors as you look back over the last few weeks?* This aim was accomplished through a secondary analysis of the WISER database of HCWs. The specific aims of this chapter are:

- (1) To identify and quantify how HCWs describe their biggest stressors over the last few weeks.

1.8.2 Chapter Three Aims

Chapter 3 takes a person-centered approach to understanding how burnout and resilience occur together in nurses. A secondary analysis of the WISER dataset using a latent profile analysis of nurses will be conducted. The specific aims of this chapter are:

(1) To identify subgroups of nurses based on their profile of burnout (emotional exhaustion), and resilience (emotional recovery and emotional thriving).

(2) To determine nurses' sociodemographic, professional, and psychological characteristics associated with the identified profiles.

1.8.3 Chapter Four Aims

Chapter four aims to increase an understanding of the association of well-being behaviors and resilience among HCWs. Specific aims of this chapter are to:

(1) Identify types of well-being behaviors associated with emotional thriving and emotional recovery.

(2) Determine the relationship between total number of well-being behaviors with emotional thriving and emotional recovery, covarying for sociodemographic and professional characteristics.

1.8.4 Chapter Five

Chapter five concludes the dissertation with a comprehensive summary of the three studies, provides implications for nursing research and practice, and discusses future research priorities resulting from this dissertation's findings.

Chapter 2. Stressors Among HCWs: A Summative Qualitative Content Analysis

(Rink, Oyesanya, Adair, Humphreys, Silva, & Sexton, 2023)

2.1 Introduction

In the United States, healthcare worker (HCW) well-being has received renewed national attention as high levels of stress and burnout have been well-documented in various patient care settings (National Academies of Sciences, Engineering, and Medicine [NASEM], 2019). HCW stress and burnout have also been exacerbated by the ongoing COVID-19 pandemic (Shechter et al., 2020a). Further, stress among healthcare workers is not unique to the United States. For instance, global studies, including ones conducted in Iran (Galehdar et al., 2020), China (Liu et al., 2020), and the United Kingdom (Nyashanu et al., 2020) have demonstrated HCWs have also reported experiencing stress. Current research lacks information on the different types of stressors HCWs are facing. To address this knowledge gap, the purpose of this study was to assess self-reported stressors among HCWs. Understanding the full range of HCW stressors can inform how to develop future interventions that aim to reduce HCW stress and burnout.

2.1.1 Background

Stress among HCWs is pervasive, having been historically studied in advance of the COVID-19 pandemic. Stress, a concept that varies widely across the literature, can broadly be described as “what arises when something you care about is at stake” (McGonigal, 2015). Before the COVID-19 pandemic, HCW stress levels were already above 60% for physicians, advanced care providers, and nurses (Jordan et al., 2016; Linzer et al., 2016). Recent studies demonstrate increased levels of stress among HCWs during the COVID-19 pandemic. For instance, a 2022 survey of 11,964 nurses found that over 70% reported recently experiencing stress (American Nurses Foundation [ANF], 2022) and nearly 30% of 2373 physicians reported high stress (Linzer et al., 2021). Another study with a sample of physicians, nurses, and other advanced care providers during the early COVID-19 pandemic reported 57% had acute stress (Shechter et al., 2020a). Extended periods of high stress levels are a precursor to burnout (Williams et al., 2007), defined as prolonged stress that culminates in emotional exhaustion, depersonalization, and diminished professional efficacy (World Health Organization [WHO], 2022). Recent evidence has found alarming increases in burnout among nurses during the pandemic from 40.6% reporting a concerning level of emotional exhaustion in 2019 to 49.2% in 2021-2022 with increases also seen in physicians and other healthcare

workers (Sexton et al., 2022). Moreover, research has shown that high levels of stress are strongly related with anxiety and depression (Linzer et al., 2021).

HCW's stress and burnout also has a harmful influence on patients. Increases in medical errors are related to nurse stress (Melnik et al., 2018) and physician burnout (Tawfik et al., 2019). Another key element of patient safety linked to HCW burnout are hospital-acquired infections (Cimiotti et al., 2012). Lower patient satisfaction has also been reported in the setting of higher burnout (Brooks Carthon et al., 2021).

Additionally, and of great significance, research has shown that length of stay is longer and risk of patient mortality is higher in settings with high nurse burnout (Schlak et al., 2021).

These far-reaching effects of stress and burnout on HCWs and patients have garnered widespread attention from the American Nurses Foundation who is partnering with other nursing organizations for a well-being initiative for nurses (ANF, 2022) and the National Academy of Medicine (NAM), who is leading an action collaborative on clinician well-being and resilience (NASEM, 2019). The 2019 NAM report, "Taking Action Against Clinician Burnout," recommended increased need to focus on systems-level rather than an individual-level approaches to address HCW burnout (NASEM, 2019). NAM's recommendations proposes that solutions to ongoing problems with HCW stress and burnout should match the root causes of burnout, which are often

systems-level issues (e.g., workload and burdensome information technology tools) (NASEM, 2019). However, in contrast, researchers recommend that individual-level interventions (e.g., those that are more personal, such as gratitude practices and increasing social connections) are also needed for the challenges HCWs are currently experiencing with stress and burnout (Rehder et al., 2021). Additionally, recent research has shown that issues with physical and mental health are a close second behind work-related stressors when it comes to factors increasing the odds of physician trainees experiencing stress and burnout (Zhou et al., 2020). Thus, work-related issues are not the only sources of stress and burnout.

Research assessing the sources of stress and burnout among HCWs is often currently focused on work environment (NASEM, 2019). Other recent research has similarly focused on this context of the COVID-19 pandemic (Linzer et al., 2021; Munn et al., 2022; Prasad et al., 2021), where generalizability outside of this extraordinary context may be limited (Munn et al., 2022). Thus, there remains a gap in research that assesses a comprehensive range of stressors among HCWs outside of a narrow context. To better understand the optimal mix of approaches, this study sought to understand the full spectrum of what HCWs report as their major stressors without limiting the assessment to a certain type of stressor, a certain level of stressor or a certain context. Therefore, this

study aimed to answer the following question: what do HCWs report as their most recent major stressors?

2.2 Methods

2.2.1 Design

We used a qualitative descriptive design (Sandelowski, 2010), using an inductive approach to guide the analyses (Elo & Kyngäs, 2008; Kondracki et al., 2002). This method requires staying near to the data. In health science research, a qualitative descriptive design provides an avenue for rich descriptions that seeks to understand and convey people's experience (Bradshaw et al., 2017). The epistemological underpinning for the qualitative descriptive design aligns with subjectivism, where the findings are co-created between participant responses and the researcher(s), through the participants sharing their experience and researchers analyzing, interpreting, and reporting the findings (Bradshaw et al., 2017). This qualitative descriptive study used baseline data from HCWs enrolled in the Web-based Implementation of the Science for Enhancing Resilience (WISER) longitudinal parent study. Initially, the parent study was developed as a brief and accessible online intervention to assist in coping with stress and enhance resilience, including use of interventions that focus on gratitude, and cultivating relationships while increasing social connection for neonatal intensive care healthcare providers (Grant #: R01 HD084679-01, PI: Jochen Profit & J. Bryan Sexton). After

beginning the parent study, the WISER study was expanded to include HCWs across a wide range of departments and settings. This study received approval from the Duke Health Institutional Review Board prior to commencement (Reference number Pro00063703). Participants consented to the study prior to voluntarily participating. Methods are reported in accordance with Standards for Reporting Qualitative Research (SRQR) guidelines.

2.2.2 Sample and Setting

Participants as part of the parent study sample included HCWs who were 18 or older, spoke English, and worked in either clinical or non-clinical work settings across the United States. In the present study, the same inclusion criteria were used, and the sample of those enrolled in the WISER study included U.S. healthcare workers ($N=2310$) who completed the baseline survey between June 1, 2018 to April 19, 2019 when analysis of the dataset was initiated. This timeframe allowed us to assess baseline stressors prior to the COVID-19 pandemic. Additionally, participants included in the present study answered questions about their current level of resilience and responded to the question “What are your biggest stressors as you look back over the last few weeks?” The sample was recruited through educational talks, webinars, and through the WISER team’s website (<https://www.hsqu.dukehealth.org/>, labelled bit.ly/3WISER). Participants

received text messages with tool links and surveys to complete. Participants were not compensated for their involvement in the study.

HCWs in this study represented a variety of positions in inpatient and outpatient settings who worked with adults, pediatrics, or both. Both clinical setting and clinical population included an option for HCWs to select “not applicable.” The sample included nurses, physicians, physician assistants/nurse practitioners, other healthcare workers (e.g., clinical support/nurse assistant, dietician/nutritionist, pharmacist, technologist/technician, clinical social worker, chaplain, respiratory therapist, physical therapist, speech therapist, occupational therapist, EMT-B, and paramedic) and the general category of other (environmental support, other manager, administrative support, student, and those who selected “other”).

2.2.3 Data Collection

Data were collected via Qualtrics, an electronic survey platform. Baseline enrollment data collected in the parent study, which used a convenience sample, were evaluated for this analysis. HCWs provided sociodemographic information, including self-reported gender, race, and ethnicity, as well as professional characteristics (e.g., HCW role, shift length, total years of experience, years in current position, work department, clinical population, and clinical setting). Participants were asked to provide an open-text response to the question: “*What are your biggest stressors as you look back over*

the last few weeks?" Length of open-text responses ranged from 1-151 words. All open-text responses were included in analysis. HCWs must have provided a response to be included in this sample. The fully de-identified dataset was maintained on a secure password-protected server.

2.2.4 Analytic Procedures

A summative content analysis was chosen to analyze both how HCWs described their stressors and determine the frequency of these stressors (Hsieh & Shannon, 2005). We took an inductive approach that allowed our codes and categories to be identified directly from our data rather than comparing participants' responses to existing theory or literature (Elo & Kyngäs, 2008; Kondracki et al., 2002). Data were uploaded into the data management software, NVivo 12 (QSR International Pty Ltd., 2018). Throughout analyses, NVivo was used to manage codes and keep track of frequencies of codes. Each time a code was endorsed, it counted toward the total number of references.

Following guidance from Hsieh and Shannon (2005), a summative content analysis allowed for an interpretation of both the words and the frequencies in which HCWs described their stressors. The unit of analysis was each participant's full response (Elo & Kyngäs, 2008). Next, all responses were read by the first author to gain a comprehensive understanding of the data and reflective notes of the data were written as intermittent memos along the way (Hsieh & Shannon, 2005). The first author then

developed descriptive codes to describe the data or used in-vivo codes, which are codes mirroring the participant's language (Hsieh & Shannon, 2005; Miles et al., 2020). We conducted an iterative process of coding and memo writing to allow for real-time reflexivity of the data analysis process (Miles et al., 2020). Additionally, the full response was often coded in multiple places as HCWs typically discussed several different types of stressors that required different codes. For example, we coded the following response, "Work, to do list at home, money" using three codes: "work," "to do list at home," and "money."

As we coded, we developed our codebook, including codes names, definitions, and quotation exemplars. The second author, a qualitative expert, reviewed multiple iterations of the codebook and also independently coded 15% of the data and compared codes to the first author. Discrepancies in this coding were discussed until consensus was met. The research team engaged in peer debriefing with the third author, who provided expertise on HCW stress and burnout, discussing coding procedures, codes, code definitions, and quotation exemplars periodically. The research team then reviewed the codebook for similar codes that could be grouped into categories to provide for condensed, meaningful representations of the patterns that were identified from the data (Miles & Saldaña, 2020). Finally, similar categories were grouped together into themes (Hsieh & Shannon, 2005).

2.2.5 Trustworthiness

Credibility, transferability, dependability, and confirmability were used to increase trustworthiness of finding (Tracy, 2010). Credibility, defined as the believability of the results was achieved through providing a thorough description of methods and context surrounding the study and a detailed description of the findings (e.g., thick description). Transferability, defined as when the reader has a sense that findings could apply to their own experience, was reached through the use of quotation exemplars from the majority of our participants to support each theme as evidence of our findings and to provide an accurate vivid account of the results to allow the reader to determine if findings could apply across settings (Tracy, 2010). Dependability reflects the enduring and consistent nature of the findings across time and settings (Beck, 2009), and was met through use of audit trails that detailed all aspects of the research process. Confirmability, defined as the degree of impartiality of the findings (Beck, 2009), was achieved through use of a research team, peer debriefing, and discussing coding discrepancies until consensus was met.

2.3 Results

HCWs ($N=2310$) responded to the open-text question: *What are your biggest stressors as you look back over the last few weeks?* Descriptive statistics for this sample are presented in Table 2. Most respondents were female (82.6%) and white (87.3%). Nurses

(32%) made up the largest proportion of HCW roles followed by those in the general other category (26.3%) (e.g., environmental support, other manager, administrative support, student, and those who selected “other”), and physicians (21.1%). HCWs most often reported working 8-hour shifts (39.2%) followed by 12-hour shift (28.4%). Most HCWs in the sample had 21 or more years of total experience (35.2%) and 1 to 4 years in their current position (37.8%). Most HCWs practiced with an adult patient population (39.4%), worked in the inpatient setting (48.7%), and in the other department category (55.1%; neurology, physical medicine & rehabilitation, preventative medicine, psychiatry, radiology, urology, those who selected not applicable and “other”).

Table 2 *Sample Characteristics (N=2310)*

Characteristic	Statistic
Self-reported Gender	N=2280
Female	1883 (82.6%)
Male	397 (17.4%)
Race	N=2289
White	1998 (87.3%)
Black/African American	105 (4.6%)
Other Minorities	186 (8.1%)
Ethnicity	N=2282
Hispanic/Latinx	120 (5.3%)
Non-Hispanic/Non-Latinx	2162 (94.7%)
Healthcare Worker Role	N=2308
Nurse	738 (32%)
Physician	486 (21.1%)
Physician Assistant or Nurse Practitioner	104 (4.5%)
Other healthcare workers	374 (16.2%)
General other	606 (26.3%)
Shift Length	N=2162
8 hours	848 (39.2%)
10 hours	515 (23.8%)
12 hours	613 (28.4%)
Other	186 (8.6%)
Total Years of Experience	N=2283

<1 year	60 (2.6%)
1-4 years	304 (13.3%)
5-10 years	484 (21.2%)
11-20 years	631 (27.6%)
21+ years	804 (35.2%)
Years in Current Position	N=2290
<1 year	361 (15.8%)
1-4 years	866 (37.8%)
5-10 years	483 (21.1%)
11-20 years	378 (16.5%)
21+ years	202 (8.8%)
Department	N=2235
Emergency Medicine	165 (7.4%)
Critical Care Medicine	197 (8.8%)
Family and Internal Medicine	164 (7.3%)
Anesthesiology and Surgery	91 (4.1%)
OB/Gyn	85 (3.8%)
Pediatrics	302 (13.5%)
Other	1231 (55.1%)
Clinical Population	N=2276
Practices with Adults	896 (39.4%)
Practices with Pediatrics	628 (27.6%)
Practices with Both	406 (17.8%)
Not Applicable	346 (15.2%)
Clinical Setting	N=2258
Inpatient	1100 (48.7%)
Outpatient	719 (31.8%)
Not Applicable	439 (19.4%)

N=Available Data; n of N (%) reported. **Race:** Other Minorities=Asian, Native Hawaiian or Pacific Islander, American Indian or Alaska Native; **Healthcare worker role:** other healthcare workers=clinical support/nurse assistant, dietician/nutritionist, pharmacist, technologist/technician, clinical social worker, chaplain, respiratory therapist, physical therapist, speech therapist, occupational therapist, EMT-B, paramedic; and other=environmental support, other manager, administrative support, student, and those who selected "other"; **Shift length:** Other=24 hours and "other"; **Department:** Other=Neurology, Physical Medicine & Rehabilitation, Preventative Medicine, Psychiatry, Radiology, Urology, not applicable and "other"

Three main themes were identified from HCW responses, including major stressors related to: (a) work, (b) personal life, and (c) the intersection between work and personal life. The total number of times a stressor of any type (total frequency) was

referenced by the participants was 4156. Table 3 presents the different themes, subthemes, and categories of stressors along with the number of times and the percent of the total frequency each stressor theme, subtheme, and category was referenced.

Figure 2 depicts the three themes and their relationship with one another.

Table 3 Health Care Workers' Descriptions of Recent Significant Stressors

Stressor Type	Frequency of Stressor (f)	% of Total Stressors (% of 4156)
Work Stressors	2017	49%
Systems-level work stressors	648	16%
Work demands	453	11%
Systems-level work barriers	195	5%
Core work stressors	597	14%
General work issues	364	9%
Specific work issues	233	6%
Team member stressors	397	10%
Lateral or general work relationships	208	5%
Upper-level work relationships	82	2%
Team member interactions and work culture	54	1%
Lower-level work relationships	53	1%
Individual-level work stressors	375	9%
Internal concerns	160	4%
Career changes and concerns	124	3%
Education and training	91	2%
Personal Life Stressors	1342	32%
Family-related stressors	690	17%
Close and extended family	442	11%
Children	248	6%
Personal life stressors	652	16%
Personal health	229	6%
Home or housing	156	4%
Personal relationships	139	3%
General life stressors	110	3%
Time-related stressors	18	0.4%
Intersection between work and personal life stressors	797	19%
General stressors that could affect work and/or life	577	14%
Finances and money	204	5%
Time	87	2%
Stressors outside of one's control	66	2%
Volume of things to do	61	1%

Relationships	55	1%
Mental health	53	1%
Existential issues, purpose, and/or change	29	
		0.7%
Lacking sense of focus, organization, and prioritization	22	0.5%
Dual work and personal life stressors	220	5%
Balance	136	3%
Concurrent work and personal life stressors	26	0.6%
Personal health and its relation to work	16	0.4%
Commute and traveling for work	16	0.4%
Work encroaching on personal life	15	0.4%
Time constraints related to work and personal life	11	0.3%

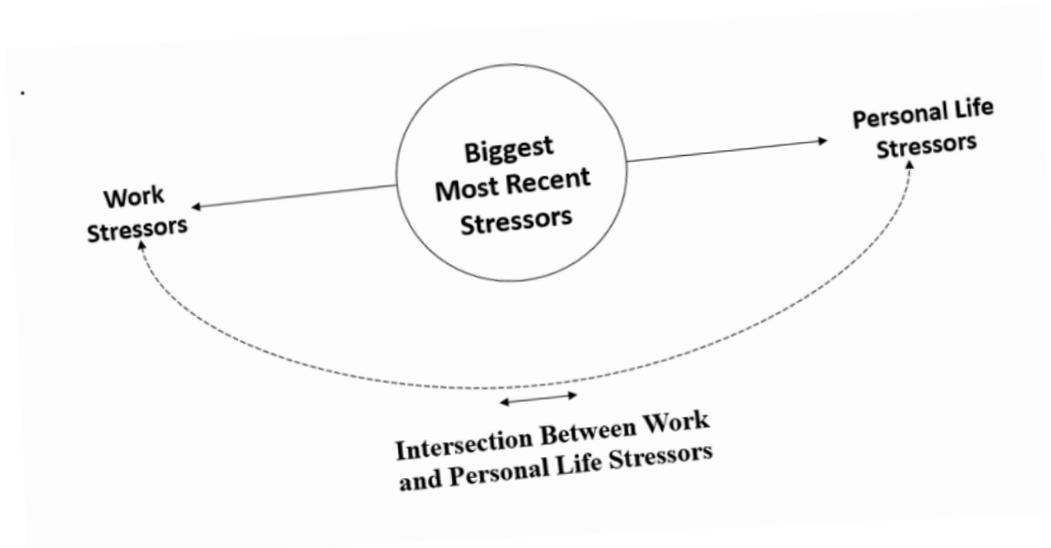


Figure 2 *Relationship Among the Themes*

Healthcare workers' biggest most recent stressors include (a) work stressors, (b) personal life stressors, and the (d) intersection between work and personal life stressors. Work was the most frequently mentioned stressor thereby tipping the balance towards work. There were also issues that traverse both work and personal life that include but are not limited to financial stressors and work-life balance.

2.3.1 Theme: Work

Work stressors included any stressor that relates to HCWs professional lives. Of the 4156 stressors mentioned, approximately 49% were work stressors. Four main subthemes were identified from work stressors, listed in order of frequency, including: (1) systems-level work stressors, (2) core work stressors, (3) team member work stressors, and (4) individual-level work stressors.

Work Subtheme #1: Systems-Level Stressors

Systems-level stressors encompassed inefficiencies in the work setting that may have made work more difficult, including factors largely outside of HCWs' control and included approximately 16% of total stressors. Two main components of this sub-theme were work demands and systems-level barriers.

Work demands exerted pressure on the individual HCW or their larger work unit, which included about 11% of total stressors. Work demands included high workload, time related stressors, and staffing challenges. Workload described HCWs ever increasing to-do lists often within limited time frames, as one HCW stated: "Too many competing priorities at work and never enough time. Work continues to get piled on, but nothing has been taken away." Time-related stressors included problems with long shifts, scheduling, impending deadlines, and unfulfilled desires for time off. HCWs commented about having "no control over my schedule" and "slim to zero chances of

getting time off soon.” Others talked about the excessive amount of time spent at work, “working 80 hours in inpatient setting during a single week plus 24/7 phone calls resulting in severe sleep deprivation.” Staffing challenges referred to not having enough staff to complete the work assigned, exemplified by comments including, “continued short staffed, too many patients to have time to provide the best care.”

Systems-level barriers, with approximately 5% of stressors, included organizational or institutional requirements that caused additional stress for the HCW. These barriers included technology, administrative responsibilities, and work-related financial issues. Technology stressors focused on challenges using the electronic medical record systems, computer problems, and software updates, demonstrated by comments like “keeping up with electronic documentation.” Administrative responsibilities were described as the high volume of emails, paperwork, and meetings. Work-related financial issues included complaints about salary such as, “No salary increase this year despite doing good work” and larger budgetary issues related to work as in “maintaining monetary reimbursements in my practice.”

HCWs also described a lack of work resources, challenges with the physical environment, regulatory concerns, and broader healthcare system concerns as additional system-level barriers. Lack of work resources included inadequate personnel and resources, as one HCW stated that they were “trying to make a difference at work with

minimal resources." Problems with the physical work environment, included noise, limited space, or having to travel to new work locations as one HCW stated, "working in a new department with new people, lack of office space." Regulatory and oversight related stressors included concerns regarding visiting accreditors such as "Joint Commission Surveys" and "accreditation prep at work." Broader health systems concerns had general comments with limited specificity such as, "dismay over current healthcare system" and "red tape at work." HCWs also listed work processes, workflow, and inefficiencies in general as common stressors.

Work Subtheme #2: Core Work Stressors

Core work stressors were focused on the nature of the work itself including both general and specific work issues. Approximately 14% of the stressors were core work stressors.

The general work category was reported in approximately 9% of stressors and encompassed general comments such as, "work" or "job" without further elaboration. Other unspecified comments about work responsibilities, expectations, requirements, commitments, complications, and changes with personnel were made. Human resource related issues such as retention and recruitment were also discussed, as one HCW stated, "dealing with losing my good friends/coworkers to other jobs."

About 6% of stressors described specific issues with HCWs' work related to patient-related challenges including patient acuity, difficult patients, conflict with patient families, patient death, and fear of making patient errors, especially when caring for critically ill patients. Other related patient issues included challenging work assignments and the inability to complete work, demonstrated by statements such as "completing my work and getting out on time." Other specific work stressors included work projects, presentations, and evaluations. For those also working in the academic or education realm, HCWs reported stressors with research, writing (e.g., "writing deadlines"), and academic workload, as one HCW reported, "...academic medicine is a never-ending black hole of potential work without a clear end."

Work Subtheme #3: Team Member Stressors

Approximately 10% of stressors included relationships with other members of the team as a stressor in this subtheme. Three main relationships with team members were found: a) lateral, b) upper-level (e.g., from employee to supervisor) and c) lower-level (e.g., from supervisor to employee). Additionally, there were stressors that related to toxic work culture and communication issues.

Lateral relationships, reported in about 5% of stressors, included difficult or challenging relationships with coworkers who were at the same level as the HCW or who were not specified as supervisors or subordinates. HCWs shared problems with

coworkers, such as “coworker made cruel comments” or characterization of colleagues being negative, lacking competence, being immature, or unprofessional. Upper-level work relationships reported in 2% of total stressors reflected stressors from the employee about their supervisor (or boss, manager, leadership, etc.). HCWs often reported that their leader fell short of their expectations, were intimidating or uncaring including statements like, “poor management,” “bad supervisors that are unprofessional,” or “contentious relationship with supervisor.” Lower-level work relationships reflected stressors from the perspective of the manager or leader about subordinates in about 1% of stressors and included concerns about meeting needs of staff, the number of direct reports, that staff lacked initiative or were unhappy, or difficult leadership decisions, such as firing a staff member and “delivering unwelcome news to staff members.” Toxic work culture, reported in approximately 1% of stressors, was also described as a stressor, where HCWs discussed their “negative work environment” and “toxic office environment.” Relatedly, communication issues related to the culture at work were described as either being poor, lacking, or incomplete and challenges with “workplace gossip” and “politics at work.”

Work Subtheme #4: Individual-Level Stressors

Individual-level stressors were self-focused and included internal concerns (emotions at work, low job satisfaction, unknowns at work, and time away from work),

career concerns, and education- and training-related stressors. These individual-level stressors were reported in approximately 9% of stressors.

Internal concerns were reported in approximately 4% of stressors. Emotions at work often included a sense of feeling 'less than' at work, such as a feeling of imposter syndrome, where a HCW reported, "Feeling incompetent – I'm good at my job but I feel like I'm not as good as others think I am." Other emotions included feeling unappreciated, frustrated, sad, or anxious as where one HCW reported, "Anxiety toward working in the ICU." Those discussing job satisfaction suggested a deficit existed such as comments regarding lack of fulfillment or lack of motivation and enjoyment. The unknowns at work were illustrated as, "Going into work not knowing what assignment I am going to receive and how the workload is going to be." HCWs also experienced stress related to preparing to take leave from work where a HCW shared "Bringing closure to projects before going on vacation" and returning to work, as seen in this HCW's comment, "Catching up at work after time off."

Career changes and concerns, reported in about 3% of the stressors, included job transitions and general career worries, such as getting a new job, job change, or job loss. General career worries encompassed comments such as "career setbacks," and "no career growth." An additional individual-level stressor impacting work was education and training related stressors, reported by in about 2% of total stressors, where many

HCWs simply reported “school” or taking board exams. Others focused on their own training including training for Extracorporeal Membrane Oxygenation (ECMO) RN specialist or training others where one HCW stated, “Training a new nurse.”

2.3.2 Theme: Personal Life

The personal life theme encompassed stressors that are outside of work and in the HCW’s personal life (reported in 32% of total stressors). The two main subthemes associated with personal life were family-related stressors (e.g., close and extended family and children stressors) and personal life stressors (e.g., issues related to personal life that were outside of the family unit).

Personal Life Subtheme #1: Family Stressors

Family stressors included close and extended family stressors and stressors related to HCWs children. These stressors accounted for 17% of stressors.

HCWs reported family relationships, family health, family responsibilities, family time related issues, and family challenges within close and extended family stressors, which included approximately 11% of total stressors. Close and extended family relationships included marital issues such as statements where one HCW shared, “husband grumpy” or comments about the spouse’s work schedule. HCWs also reported various types of family conflict such as custody issues, arguments with family, and communication issues with one’s partner. Other family relationship stressors

included the HCW's parents such as "moving parents in with us", in-laws as in, "worry about not wanting to visit my in-laws," and family challenges, such as divorce. Family health included health of an immediate family member's health, extended family member, or mention of family health in general. Family caregiving challenges were reported in instances including "caregiving for a parent with cancer" as was family death and settling an estate following death. Family responsibilities included managing family commitments and expectations to care for family. Additionally, lack of time available for family was described, such as "missing family time."

HCWs concerns regarding their children generated comments about stressors such as childcare, children's health or education, the role of parent, and family planning and were reported in approximately 6% of stressors. Managing activities and issues surrounding either caring for one's own child or reports of "childcare" were a particular focus. Child health included children's physical or mental health illness, as one HCW detailed, "I have a child with a medical illness and when it flares up, all the negative feelings (stress, overwhelmed, worry, anxiety) take over." Children and their education also were reported stressors among HCWs, with mentions of a child's educational progress, school selection, and college-aged children away at school such as "child anxious about graduating college." The role of being a parent was identified as another children-related stressor and was exemplified by comments such as, "parenting

worries” or “being a good parent.” Additionally, HCWs discussed stressors related to planning a family, which included the desire to have a family, trying to get pregnant, and expecting or having a baby.

Personal Life Subtheme #2: Personal Life Stressors

Personal life stressors were inclusive of stressors outside of family and contained five main components: personal health, home or housing, personal relationships, time-related stressors, and general life stressors. These personal life stressors accounted for approximately 16% of the stressors.

Personal health, reported in approximately 6% of stressors, included diet, exercise, and weight with HCWs who stated, “lack of motivation to exercise” and “annoyed with myself over poor eating and overweight.” Other health issues included physical injury, pain, and surgery as one HCW shared, “Persistent back injury causing pain.” Mental health was often specified as anxiety or depression. Other health related issues included being pregnant, trying to get pregnant, or experiencing a miscarriage. HCWs also reported low energy and fatigue including, “having no physical energy” or “too tired after work to do things” along with sicknesses of a non-serious or general nature including headaches and colds or serious illnesses such as “chemo for breast cancer.”

Home or housing stressors, reported in about 4% of stressors, included relocation, and household chores or projects. Relocation included a move, buying, selling, or any combination of moving, buying and selling as exemplified by “buying a new house, contractors, moving, and packing.” Household chores or projects included renovations, chores, and household responsibility in general such as “home duties.” Other housing stressors included living situations or mention of change in the number of people living in their home including, “adapting to oldest [child] moving back in.”

Similar to the work theme that included stressors about work relationships, about 3% of stressors included personal relationships as stressors, which were non-familial and outside of work including romantic and non-romantic relationships and the HCW’s social life. Romantic relationships included conflicts: “fights with boyfriend and breakup” while non-romantic relationships included friendships as stressors such as “helping friends deal with loss” and “sick fiend.” Social life stressors involved planning or preparing for events such as the holidays or weddings including, “I’m planning my wedding which is in 45 days...,” social obligation, or social anxiety.

Time issues, reported in about 0.4% of stressors, included not having enough time for themselves as one HCW reported, “...not having the time or energy to exercise and take care of myself.” The HCW’s general life, reported in approximately 3% of stressors, encompassed finances such as bills, debt, and specific purchases or housing

related financial stressors; pet health issues, pet death, or having a new pet. Other general stressors were vacation related such as losing hotel reservations or travel delays.

2.3.3 Theme: Intersection Between Work and Personal Life Stressors

The intersection between work and personal life stressors (reported in approximately 19% of stressors) included stressors that either were not distinctly compartmentalized into their work or personal life or intersected both work and personal life. The two subthemes were general stressors that could affect work and/or personal life and dual work and personal life stressors.

Intersection Between Work and Personal Life Stressors Subtheme #1: General Stressors that Could Affect Work and/or Personal Life

General stressors were not clearly delineated between the HCWs' professional or personal life and included finances, time, mental health, stressors outside of the HCW's control, volume of things to do, relationships, and existential issues. These general stressors that could affect work and/or life were included in approximately 14% of stressors.

General financial concerns were reported in approximately 5% of stressors and were referenced as "money" and "finances" without clarity as to whether the issue related to personal life as in expenses or to work such as salary. General time issues, reported by about 2% of stressors, were those that did not clearly reside in the work and personal life themes such as "time management" or "not enough time." About 1% of

stressors were mental health that included worry about the future, feeling out of control, powerless, hopeless, and self-focused negative feelings and thoughts such as “feeling like a failure.” Events outside of the HCW’s control, reported in about 2% of stressors, also generated stress including travel, traffic, politics, or the news in general. About 1% of stressors included a high volume of things to do like “too much on my plate” or time constraints with the amount of work, “too much to do, not enough time.”

Approximately 1% of stressors were relationships that included relating to other people in general where HCWs shared, “dealing with a few difficult people;” communication: “lack of communication;” and diminished feelings of social connection or support: “lack of support” without specifying the context of work or personal life. About 0.7% of stressors were comprised of existential issues that focused on life purpose as “confused about purpose in life,” changes: “adjusting to change,” or regarding expectations: “not living up to expectations.” Approximately 0.5% of stressors described a lack in sense of focus, organization, and prioritization.

Intersection Between Work and Personal Life Subtheme #2: Dual Work and Personal Life Stressors

Approximately 5% of the stressors were dual work and personal life stressors which encompassed stressors that related to HCWs professional and personal life at the same time including balance, concurrent personal and professional stressors, personal

health and work, work-related travel, work encroaching on personal life, and time constraints related to work and personal life.

Balance was the focus of this subtheme where approximately 3% of stressors discussed work-life balance as one HCW described, “Balancing small children, marriage, work, and personal time.” Work and personal life also presented concurrent stressors as shared by approximately 0.6% of stressors, where both stressors were present or related to one another such as, “work and family obligations” and “keeping up with all the demands of home and work.” Health stressors, reported in approximately 0.4% of stressors, that related to both the HCWs’ personal and work life included sleep, “...trying to sleep after night shift. I didn’t sleep and had to call out” and physical pain or injuries related to work such as “knee pain from work” or the inability to prioritize self-care over work. Work-related travel primarily in approximately 0.4% of stressors included the HCW’s commute as described, “commute - 4 hours a day.” Work encroached on personal life in approximately 0.4% of stressors as evidenced by, “work invading family time” and “too tired after work to do things.” Time constraints, reported in approximately 0.3% of stressors, were also discussed as being related to both work and personal life as one HCW described, “lack of time to meet work and home needs.”

2.4 Discussion

The purpose of this study was to investigate what HCWs describe as their most significant stressors. Findings that were identified from the data indicated work stressors, personal life stressors, and the intersection between work and personal life stressors were key themes. Systems-level stressors were the most predominant among work stressors. Close and extended family, children, and personal health comprised the largest portion of personal life stressors. The intersection of work and personal life primarily included stressors that could affect work and/or personal life and was predominately comprised of finance, work-life balance, and time stressors. Our study adds to the literature by offering a comprehensive perspective of the multi-faceted stressors that both preceded and will likely follow the pandemic.

While the majority of stressors in the present study related to work, most work stressors discussed were about systems-level work stressors (approximately 16% of stressors). These types of stressors have been identified as the main drivers of burnout among HCWs (NASEM, 2019). Similar to our findings on staffing being a specific workload issue, research has repeatedly demonstrated that HCWs struggle with high demands and low resources to get the job done both prior to (O'Dowd et al., 2018; West et al., 2018) and within the context of the COVID-19 pandemic (Munn et al., 2022); ongoing work stressors suggesting that systems-level work issues are a key driver of

stress. Similar to our work, healthcare workers report a heavy workload as a source of stress (Long et al., 2020). Different than our work and more unique to the Covid-19 pandemic, HCWs in our sample did not discuss work-related stressors related to lack of adequate personal protective equipment, and social isolation as frequently as seen in a more recent qualitative systematic review of research on HCWs during the pandemic (Koontalay et al., 2021) as these issues were likely not at the forefront pre-2019. Additionally, as seen in prior research (Gardner et al., 2019; Michel et al., 2017; Rao et al., 2017), our findings highlight the systems-level issues (inadequate staffing, technology, EMR requirements, and administrative tasks) that could detract from the HCWs primary job (i.e., patient care), though this was not explicitly stated. Our findings support the need to continue a substantial focus on addressing stress and burnout through systems-level approaches.

Similar to other studies, the present study demonstrates that stressors extend beyond the work environment to personal life, including family and children (Mullen, 2015) and the HCW's personal health (Zhou et al., 2020). Our findings of family relationships conflicts and lack of time with family are similar to the literature, which includes the importance of investing in relationships with family (Odom et al., 2022). Family health also was identified as a common stressor which warrants further investigation as to how healthcare organizations might support HCWs with family

health issues. We also found that HCWs were concerned about their children's wellbeing and health. This speaks to the interconnectedness between a child's suffering and that of the HCW. Similar to recent research within the context of the COVID-19 pandemic (Munn et al., 2022), childcare concerns were illuminated in this study. These findings support recent findings that suggest that research is needed to investigate how family issues, beyond those of a work-life balance perspective, impact the HCW's work lives and performance (Munn et al., 2022).

Our sample discussed stressors related to overall health such as fatigue, sicknesses, and personal health behaviors (e.g., diet, exercise, and comments regarding body weight). Our findings are similar compared to recent research that found nurses are experiencing health challenges (Melnyk et al., 2022). Workplaces supportive of nurses' personal wellness tended to have nurses who had better sleep, ate healthier, and did not experience burnout compared to nurses who felt their workplaces were not as supportive (Melnyk et al., 2022). Future research is needed to address health-related stressors and could focus on ways to improve workplace support of personal wellness.

Most comments regarding time related to the work realm such as length of time spent on work, work deadlines, and work pressures. Experiencing time-related stressors at work likely play a role in the perception of an imbalance between work and life (NASEM, 2019). Further study should be considered on how to reduce time-related

burdens on HCWs. Healthcare organizations might start with interventions that address the number of hours worked each week given that longer work hours are associated with association with poorer work-life integration (Tawfik et al., 2021), depression, stress, burnout, and poorer physical health (Melnyk et al., 2022). Study should occur at various settings and across types of healthcare workers whose roles may look different (e.g., bedside nurses, physicians, administrators, and other healthcare roles).

Nearly 3% of stressors were about balance, including work-life balance. Our finding of issues related to work-life balance as a stressor is similar to other research on physicians who reported work-life balance as a reason for leaving practice (Long et al., 2020). The strain of balancing personal life and work life has implications for greater HCW burnout and poorer teamwork (Schwartz et al., 2019). While healthcare organizations can't control what HCWs experience as stress on a personal level, they can support HCWs by promoting organizational programs that promote culture shifts for a healthier work-life balance or work-life integration, such as encouraging and celebrating time away from work. Focusing on the various aspects of work culture, including work-life balance, is particularly important as work culture is a greater contributor to burnout than the commonly reported stressor of electronic health record use (McPeck-Hinz et al., 2021). Simultaneously, systems-level processes must be in place to allow for efficiency in work processes that facilitates completion of work in a timelier fashion (NASEM, 2019)

while also making the possibility of lighter schedules more feasible from the organization's perspective. Another consideration for the intersection of work and life is the degree to which various stressors in work and personal life have a synergistic effect rather than simply as additive. Future research may consider explicitly asking HCWs about concurrent work and personal life stressors to understand the full extent of these stressors experienced by HCWs.

Relationships both inside and outside of work were an important thread throughout our findings, showing that relationships across HCWs lives, relatively distributed across work and personal life, are a source of stress. Research has demonstrated that work relationships, including teamwork, have an inverse relationship with burnout (Profit et al., 2014). Thus, finding ways to improve work relationships, and particularly teamwork can possibly improve HCWs' burnout (Profit et al., 2014). In addition, developing and testing interventions that aim to improve HCW's relationships outside of work is worthwhile as 69% of over 11,000 nurses reported that spending time with family and friends is an important activity to strengthen well-being (ANF, 2022) and spending time with friends is related to greater emotional thriving and emotional recovery, two components of resilience (Rink et al., 2021).

2.4.1 Theoretical Application

While the present study utilized an inductive, qualitative approach, allowing findings to be identified directly from the data (Elo & Kyngäs, 2008; Kondracki et al., 2002), the results have similarities with existing theory. For instance, Bronfenbrenner's ecological theory contains multiple unique and interdependent levels inclusive of the individual level spanning to larger system levels (Bronfenbrenner, 1977; McLaren & Hawe, 2005). This study's findings show that stressors among healthcare workers reside at the individual level, as seen in personal life stressors, and extend outward to encompass the broader environment. This broader environment with multiple interrelated factors was evident in the instances where home responsibilities coupled with work system factors such as workload and scheduling created work-life balance stressors. Further knowledge on how stressors may exist and intermingle across the different levels of Bronfenbrenner's model could extend existing knowledge and inform interventions on how to reduce the occurrence of stressors among healthcare workers.

Additionally, the findings parallel several features of the National Academy of Medicine's Systems Model of Clinician Burnout and Professional Well-being, including the model's work system factors and individual mediating factors (NASEM, 2019). In the present study's findings, HCWs similarly described the work system stressors of workload, administrative inefficiencies, and issues with technology, such as the

demands of charting. HCWs also delineated individual stressors outside of these work system factors similar to the NAM model such as personal relationships. The NAM model notes that “relationships can be a source of support as well as of stress” (NASEM, 2019, p. 110). While this study found these similar features with the NAM model, the nature of the present study cannot demonstrate the interactions between the different levels of these systems (e.g., individual factors as a mediator between the work system and outcome of burnout or well-being). However, the multi-faceted stressors reported by HCWs in this study suggest additional inquiry is needed to understand the extent to which individual factors can also influence work system factors.

2.4.2 Strengths and Limitations

This study has numerous strengths, including exploring HCW stressors using a large sample size that includes a variety of HCWs across settings. Given the interdisciplinary teamwork nature of healthcare, assessing stress and burnout across HCWs is important to understand the full picture, rather than only looking at certain groups (e.g., nurses or physicians only). Additionally, the open-text nature of our data allowed for a broader perspective beyond work stressors, uncovering the importance of work, personal life, and the intersection between work and personal life.

However, this study is not without limitations. Limitations of the study include the sometimes-brief responses that HCWs provided in answering the question through

the online survey as opposed to an interview where follow-up questions could be asked to gather more details. However, we used a summative content analysis to glean information from even the shortest responses where we could assess how frequently people used certain words. Additionally, participants could describe similar stressors within the same theme, subtheme, or category which has the potential for inflating a particular stressor type (e.g., work stressors). However, each response was only coded multiple times if the response had notable distinctions. For example, the response “Taking time off work, learning new things at work” was coded in two categories within the work theme related to time off and learning at work. Finally, the category of concurrent stressors is likely underrepresented. Many HCWs described several different work and personal life stressor types in their responses that could be related; however, the relationship was not always specified as clearly as seen in this response, “Trying to learn a new job and worrying about the impact to my home life.” Despite this limitation, the various subthemes and categories are representative of the large variety of stressors reported by HCWs.

2.4.3 Future Research

Future research should include all complex sources of stress and burnout, including those from both work and personal life (West et al., 2018) and the intersection between work and personal life. A continued research focus on systems-level drivers of

stress, such as inadequate staffing and workforce pipeline issues (e.g., lack of nursing professors available to support an adequate number of nursing students to meet the demand), is needed. Personal life stressors also warrant future study, including how family issues, personal or family health and wellness, and relationships impact HCWs work lives and performance (Munn et al., 2022). Future research should also parse out the synergistic effects of work and personal life stressors while considering ways to improve work-life integration for HCWs.

2.4.4 Conclusion

Our sample of 2310 HCWs described three main types of stressors including work (49% of stressors), personal life (32% of stressors), and stressors that intersect work and personal life (19% of stressors). This study has produced new insights on day-to-day stressors that are not neatly compartmentalized in one area of life and instead could be related to work, personal life, or the intersection of both. Future researchers should consider developing and testing interventions to address the numerous stressors that affect HCWs on a day-to-day basis. Our findings also suggest that future research is needed to address the complex sources of stress inclusive of work and personal life.

2.4.5 Relevance to Clinical Practice

In alignment with findings from the present study, healthcare leaders may wish to assess common stressors among their healthcare workers. Understanding the degree

to which stressors stem from work, personal life, or some combination of the two can inform effective solutions. Our findings indicate that stressors are encompassed by work, personal life, and the intersection between work and personal life in order of most often reported; however, these results could look different across work settings and disciplines. Once the top stressors have been identified, healthcare organizations could test feasible interventions to align with the drivers of stress experienced by their employees. Additionally, interventions that consider the busy clinician's work and personal life should be prioritized. A recent randomized clinical trial found statistically significant improvements that were sustained at 1 year in HCW symptoms of depression, work-life integration, happiness, emotional thriving, and emotional recovery after exposure to brief positive psychology well-being modules sent via text (Sexton, Adair, Cui, et al., 2022). Finally, nursing and other healthcare leaders may consider ways in which the culture can be shifted from a work-life balance perspective to a life-work balance. This suggests a paradigm shift, from fitting life issues such as family, personal health, and personal relationships into a busy work schedule and instead seeks to integrate work into HCWs busy personal life.

Chapter 3. Characterizing Burnout and Resilience Among Nurses: A Latent Profile Analysis

3.1 Introduction

Nurses are at the front lines of patient care and play a large role in improving outcomes and lowering costs of care for patients with acute and chronic conditions (National Academies of Sciences, Engineering, and Medicine [NASEM], 2021). However, nurses' ability to deliver high-quality patient care is hindered by burnout (Salyers et al., 2017), characterized as unresolved and ongoing stress that lead to emotional exhaustion, depersonalization, and a diminished sense of professional efficacy (World Health Organization, 2022). Prior to the COVID-19 pandemic nearly 35% of nurses reported burnout (Dyrbye et al., 2019) with rates of nurse burnout climbing to 49% in 2022 (American Nurses Foundation [ANF], 2022). Importantly, this compromised level of well-being has critical consequences for nurses, patients, and healthcare organizations.

3.1.1 Background

Implications of burnout on nurses are demonstrated in high rates of psychological distress among U.S. nurses (ANF, 2022; Shechter et al., 2020). In a sample of healthcare workers that included 657 nurses in New York City, over 50% reported symptoms of acute stress, 48% reported depression, and 33% reported anxiety (Shechter et al., 2020). Similarly, an American Nurses Foundation survey of 11,964 nurses, 71% reported feeling stressed and 31% reported feeling depressed (ANF, 2022). Adding to

the challenges of these psychological symptoms is the positive relationship shared with burnout. For instance, depression and burnout are related in that higher depression scores are associated with higher burnout scores (Chen & Meier, 2021; Rehder et al., 2020).

Nurse burnout also has significant clinical and operational consequences for patients and healthcare organizations. For instance, increased nurse burnout is related to higher rates of patient mortality and longer lengths of stay (Schlak et al., 2021). Additionally, burnout contributes to decreased patient satisfaction (Brooks Carthon et al., 2021), increased medical errors (Melnik et al., 2018), and greater hospital-acquired infection rates (Cimiotti et al., 2012). One study found an association between nurse burnout scores and higher rates of nurses leaving a particular healthcare system (Kelly et al., 2021). Hospital nursing turnover rates in 2022 across the U.S. were 25.9%. Replacing one hospital nurse costs \$46,100, on average, which translates to a loss greater than \$5 million per hospital in the USA (Nursing Solutions Inc., 2022).

One positively framed approach to addressing these multifaceted vulnerabilities from nurse burnout is through resilience. Resilience has been defined as “a complex and dynamic process, which when present and sustained, enables nurses to positively adapt to workplace stressors, avoid psychological harm and continue to provide safe, high-quality patient care” (Cooper et al., 2020, p.15). Resilience is preceded by an adversity or

challenge (Cooper et al., 2020; Masten, 2014), which are abundant in the nursing work environment due to long shifts, complex patients, and significant charting requirements (NAESM, 2021). Resilience is also considered to be a protective factor against burnout (Guo et al., 2018; Rushton et al., 2015).

More specifically, two of the main paths towards improved resilience (positive adaptation) are [emotional] recovery and [emotional] thriving (Szanton & Gill, 2010). Emotional recovery begins with a challenge prior to the person recovering back to their baseline functioning (Adair, et al., 2020; Szanton & Gill, 2010). Emotional thriving is similarly ignited by a challenge, yet the person exceeds their baseline functioning (Adair, et al., 2020; Szanton & Gill, 2010). Emotions are a core aspect in this process of recovery and thriving. Researchers have demonstrated that positive emotions in particular are a key aspect in generating resilience (Cohn et al., 2009; Tugade & Fredrickson, 2004).

Not surprisingly, nurses with high levels of resilience are best equipped to problem solve when limited resources are present to address adversities or challenges (Tubbert, 2016) and are more flexible in the face of a challenge (Matheson et al., 2016). While resilience is particularly important in the midst of high levels of burnout and psychological distress, the capacity to be resilient appears to be low among nurses as a survey of 22,316 nurses found only 20% of nurses in the sample with self-reported

resilience (ANF, 2021). Against the backdrop of a global pandemic, there appears to be substantial room to enhance nurse resilience.

Although nurse burnout is a significant issue that has repercussions for nurse, patient, and healthcare organization outcomes, the field is lacking evidence that uncovers different patterns of burnout (emotional exhaustion) and resilience (emotional recovery and emotional thriving) among nurses. For example, research has shown that higher levels of resilience are associated with lower levels of burnout (Adair, et al., 2020; Guo et al., 2018). However, the relationship between burnout and resilience may be more complex than previously thought, with new evidence showing 29% of physicians with the highest levels of self-reported resilience still experience symptoms of burnout (West et al., 2020). This relationship between high resilience and burnout is unknown in nurses. Evidence is also conflicting on nurse characteristics and their relationship with burnout and resilience, including sociodemographic characteristics such as gender and professional characteristics of professional experience (Yu et al., 2019). Future interventions may be more potent if we develop a better understanding of the association of nurse characteristics (sociodemographic, professional, and psychological) with various patterns of burnout and resilience.

3.1.2 Aims

The aims of this study were to identify subgroups of nurses with distinct profiles of burnout (as measured by emotional exhaustion) and resilience (as measured by emotional thriving and emotional recovery) as well as determine the nurse characteristics associated with the identified profiles.

3.2 Methods

3.2.1 Design

This cross-sectional, descriptive, correlational study was a secondary analysis of existing data from Web-based Implementation of the Science for Enhancing Resilience longitudinal study (WISER) study. Using a latent profile analysis (LPA) approach, subgroups of nurses working in an inpatient or outpatient U.S. healthcare setting were first identified using indicators of burnout (emotional exhaustion) and resilience (emotional thriving and emotional recovery). Further, nurse characteristics (sociodemographic, professional, and psychological) were assessed to determine which were associated with the identified subgroups based on their burnout and resilience profiles.

3.2.2 Sample/Participants

The sample for this analysis was comprised of nurses who: (1) completed the baseline survey, (2) did not have missing emotional thriving, emotional recovery, and/or

emotional exhaustion data, (3) enrolled after June 1, 2018, the time in which the final list of data collection elements were implemented; and before April 24, 2019, when the database was downloaded; (4) self-identified as registered nurses, nurse managers, or charge nurses, and (5) provided patient care in a U.S. inpatient or outpatient setting. Non-nurses and nurse practitioners were excluded as nurse practitioners and physician assistants were grouped in the same category during data collection making this category impossible to separate. See Appendix A (supplementary figure 1) for flow diagram of final sample ($N=683$).

3.2.3 Data Collection

The data source was the WISER study, funded by the National Institute of Child Health and Human Development (NICHD) (R01 HD084679-01), which was originally developed to assess the effects of web-based resilience tools on HCW well-being. The WISER database is comprised of data from healthcare workers aged 18 or older who were recruited using convenience sampling from a broad range of U.S. healthcare systems, hospitals, and clinics. Participants were recruited through presentations, educational webinars, web links (<https://www.hsq.dukehealth.org/>, labelled bit.ly/3WISER), and promotion of the study at scientific meetings. Data were collected electronically using Qualtrics.

3.2.4 Ethical Considerations

The Duke University Health Systems Institutional Review Board approved this study. The database used for this project was fully de-identified and archived on a secure, password protective server. Informed consent was obtained from participants prior to the commencement of the study.

3.2.5 Measures

Appendix A, supplementary table 1, details all key study measures.

Demographic and Professional Characteristics

Nurse sociodemographic characteristics were self-identified sex (male, female), race (collapsed into white vs. non-white), and ethnicity (Hispanic or Latinx vs. Non-Hispanic or Non-Latinx). Professional characteristics were the nurse's shift length, years of overall experience, years in current position, clinical population of care (practices with adults, pediatrics, or both, not applicable [not applicable excluded from sample]), and clinical work setting (inpatient, outpatient, not applicable [not applicable excluded from sample]). Shift length was collapsed into three categories: (1) 8 hours, (2) 9-10 hours; (3) 12 or more hours. Professional experience, including total years of overall experience and total years in current position was collapsed into two categories: (1) 0-10 years and (2) 11 or more years.

Psychological Characteristics

The Center for Epidemiologic Studies Depression Scale-10 item version (CESD-10) was used, which is a common measure of depressive symptoms (Andresen et al., 1994). The ten items assess symptoms of depression, such as feelings of hopelessness, fear, and issues with sleep (Andresen et al., 1994). The total score ranges from 0-30, with higher scores indicating greater severity of depression (Andresen et al., 1994). The CESD-10 has been tested in the healthcare worker population with Cronbach's alpha in a recent WISER study of healthcare workers having high internal consistency (Cronbach $\alpha = .85$) (Adair et al., 2020).

Positive emotions were assessed using a total of ten positive emotion items from the modified Differential Emotions Scale (mDES) (Fredrickson et al., 2019). The ten items were designed to capture common positive emotions including amusement, awe, gratitude, hope, inspiration, interest, joy, love, pride, and serenity (Fredrickson et al., 2019). Each item was rated using a 5-point Likert scale (1=Not at all; 2=A little bit; 3=Moderately; 4=Quite a bit; 5=Extremely). The items were recoded to transition the scale from 1-5 to a 0-4, as recommended by Fredrickson et al. (2019). The mean overall score for participants were derived from the ten items, with overall scores ranging from 0 to 4 and higher score indicating greater levels of positive emotions. Cronbach's alpha coefficient in a previous study was good (Cronbach's alpha=0.86) (Cohn et al., 2009).

Well-being behaviors were assessed using a questionnaire developed by the WISER team by asking respondents if they engaged in any of the following activities: (1) regular exercise, (2) yoga, (3) meditation, (4) spent time with a close friend, (5) vacation, and (6) other. These options were selected from previous exploratory research conducted by the last author who identified the five behaviors as most frequently reported in open-ended responses and has been tested in the healthcare worker population. Each well-being behavior was coded as either no (0, not selected) or yes (1, selected). A total score, ranging from 0 to 5, was derived from the summation of each well-being behavior selected.

The Work-Life Integration (WLI) Scale (blinded for review) was used to assess eight work-life integration behaviors among healthcare workers: (1)“worked through a shift/day without any breaks,” (2)“skipped a meal,” (3)“ate a poorly balanced meal,” (4)“changed personal/family plans because of work,” (5)“had difficulty sleeping,” (6)“slept less than 5 hours in a night,” (7)“arrived home late from work,” and (8)“felt frustrated by technology.” Each item was rated using the following four-point Likert scale: 1=rarely or none of the time (less than 1 day); 2=some or a little of time (1-2 days); 3=occasionally or a moderate amount of time (3-4 days); 4=all of time (5-7 days). As recommended by Tawfik et al. (2021), each item response was then reverse coded and an overall score for each participant was generated by calculating the mean score of the

eight items. The overall score was then converted to a 0-100 scale (blinded for review), with higher scores indicating better work-life integration (e.g., 0 = poor WLI = all of the time (5-7 days) and 100 = optimal WLI = rarely or none of the time (less than 1 day). Cronbach's alpha coefficient for healthcare workers in a previous study was good (Cronbach's alpha=0.81) (Sexton & Adair, 2019).

Latent Profile Analysis (LPA) Indicators

The WISER database included 13 items to assess burnout and resilience (see Appendix A, supplementary table 2). Five items were designed to evaluate the emotional exhaustion component of burnout (Q1-Q5). The remaining eight items assessed two aspects of resilience, with four items evaluating emotional thriving (Q6-Q9) and four items examining emotional recovery (Q10-Q13). Each item was rated using a 5-point Likert scale (1=Disagree Strongly; 2=Disagree Slightly; 3=Neutral; 4=Agree Slightly; 5=Agree Strongly). An overall score for each participant was generated from the respective mean score of the specified scale items (Q1-Q5 for emotional exhaustion; Q6-Q9 for emotional thriving; Q10-Q13 for emotional recovery). The overall scores were then converted to a 0-100 scale, with higher scores indicating a greater level of each construct (blinded for review). The missing rate for items at the item level was low (<0.7%). When an item was missing, the median item score for the sample was imputed.

Emotional exhaustion, defined as “wearing out, loss of energy, depletion, debilitation, and fatigue” (Leiter & Maslach, 2016), and represents a key aspect of burnout. Emotional exhaustion was measured using a 5-item derivative from the 9-item Emotional Exhaustion subscale of the Maslach Burnout Inventory scale (Maslach & Jackson, 1981), which has been used extensively in healthcare, and has excellent psychometric validity (Cronbach’s $\alpha=0.93$) (Sexton et al., 2022).

Emotional thriving was measured with four items from the emotional thriving subscale developed by the WISER investigators. Emotional thriving, indicative of “level of flourishing,” and emotional recovery, defined as the ability to bounce back from difficulties represent two aspects of resilience (Adair et al., 2020, p.615).

Factor Structure for Emotional Exhaustion, Emotional Thriving, and Emotional Recovery

The WISER study team conducted psychometric testing of the two resilience scales. Their unpublished confirmatory factor analysis (CFA) findings indicated a two-factor structure, representing separate factors for emotional thriving and emotional recovery. The resulting 4-item scale for each construct had good internal consistency (emotional thriving: Cronbach $\alpha = 0.84$; emotional recovery: Cronbach $\alpha = 0.78$) among healthcare workers (Adair et al., 2020). These results support the conclusion that emotional thriving and emotional recovery are two distinct resilience constructs.

We conducted a CFA on the analysis sample ($N=683$) of nurses to confirm that 13 items comprising the scales designed by the WISER study to measure emotional exhaustion, emotional thriving, and emotional recovery yielded a three-factor orthogonal solution for the nurses in our sample. A three-factor solution was determined, with covariance structure results indicating a good fit of the model. Appendix A, supplementary Table 3 presents the three factors and their corresponding item factor loadings. Factor 1 was comprised of five items assessing emotional exhaustion. Factor 2 included four items measuring emotional thriving, while Factor 3 was composed of four items addressing emotional recovery. The Goodness-of-Fit index (GFI) was 0.95 (possible range 0-1); Adjusted Goodness-of-fit index (AGFI) was 0.93 (possible range 0-1); Root Mean Square Error of Approximation (RMSEA) was 0.06 (possible range 0-1); and the Comparative Fit Index (CFI) was 0.96 (possible range 0-1). Cronbach's alpha was good among the nurses in our sample (Cronbach α : emotional exhaustion=0.85, emotional thriving=0.80, emotional recovery=0.83).

3.2.6 Data Analysis

Non-directional statistical tests were conducted utilizing SAS 9.4 (Cary, NC) for all analyses, except for Mplus statistical software version 7.4 (Muthén & Muthén, 1998-2015) was used for the LPA. The level of significance was set at 0.05 per statistical test.

Effect sizes and their 95% confidence intervals (CI) addressed clinical significance.

Analyses were not adjusted for multiple outcomes or tests for this initial study.

The overall scores for each of the three scales (emotional exhaustion, emotional thriving, and emotional recovery) were used in the analysis. This LPA method was used to classify nurses into subgroups based on their profiles of emotional exhaustion, emotional thriving, and emotional recovery. The best fitting model and number of profiles was determined by considering the following statistical fit indices: Akaike information criterion (AIC), Bayesian information criteria (BIC), parametric bootstrapped likelihood ratio test (BLRT), and Vuong-Lo-Mendell-Rubin likelihood ratio test (VLMR). The best fitting model included consideration of the lowest AIC and BIC (Spurk et al., 2020). Additionally, the optimal solution contained a BLRT and VLMR with a statistically significant p-value ($p < .05$) immediately followed by the subgroup with one additional profile and a non-statistically significant p-value ($p > .05$) (Spurk et al., 2020). Entropy reflects class separation and ranges from 0-1 with 1 representing groups that are perfectly distinct and separate from other groups (Tein et al., 2013). Entropy is best for describing class separation of the model chosen rather than for selecting the best model (e.g., class enumeration) (Curran & Bauer, 2021). Optimal entropy values are ≥ 0.80 (Múthen, 2017) and entropy values above 0.70 were considered

adequate in a previous LPA study on burnout (Leiter & Maslach, 2016). Each subgroup of nurses with a distinct profile of burnout and resilience was referred to as a “profile.” One-way analysis of variance (ANOVA) methods using a General Linear Model (due to expected unequal sample sizes per LPA profile) was conducted to test for LPA profile differences in overall scores for emotional exhaustion, emotional thriving, and emotional recovery. *A posteriori* pairwise contrast was performed using least squares t-tests when there is a significant overall profile effect to further determine which profile differed from one another on these three measures. Eta-squared (η^2 values and their 95% CIs were used to estimate effects size.

We used chi-square/Fisher’s exact tests to determine LPA profile differences in sociodemographic and professional characteristics. Cramer’s V values were used to estimate effect sizes. A one-way ANOVA using a GLM approach was performed to test for profile differences in psychological characteristics. Eta-squared values and their 95% CIs were used to estimate effects size. *A posteriori* pairwise contrasts were conducted using chi-square tests for categorical characteristics and least square means t-tests for scalar characteristics.

Statistical Power

As a general rule, a sample size of 300 (Sinha et al., 2021) to 500 (Spurk et al., 2020) is recommended for LPA methods. Our sample of 683 nurses, thus, was

sufficiently large to identify latent profiles of nurses. Further, the sample also provided at least 80% power for the chi-square and one-way ANOVAs to test for profile differences in nurse characteristics, assuming (1) two-tailed tests with significance set at 0.05 per test; (2) small effects sizes (e.g., eta-squared of 0.01, Cramer's V of 0.06) (Cohen, 1988).

3.3 Results/Findings

3.3.1 Sample Characteristics

Table 4 details the descriptive statistics for the sample characteristics and latent profile measures for the 683 nurses. The nurses were primarily female (95%), white (91%), non-Hispanic/non-Latinx (96%) and worked 12 hours or more shifts (55%). Nurses were generally more experienced with 33% having 21 or more years of service followed by 28% with 11-20 years. Nurses had 1-4 years in their current position (39%), worked with an adult clinical population (49%) and worked in the inpatient setting (74%). The mean summary score for well-being behaviors was 1.8 (range: 0-5), 9.5 for CESD-10 depression (range: 0-26), and 1.9 for positive emotions (range: 0-4), and 57.4 for work-life integration (range 0-100).

Table 4 *Sample Characteristics (N=683)*

Characteristic	Statistics
Self-reported gender	
Female	646 (94.9%)
Male	35 (5.1%)
Race	
White	615 (90.6%)
Black or African American	22 (3.2%)
Other Minorities	42 (6.2%)
Ethnicity	
Hispanic or Latinx	28 (4.1%)
Non-Hispanic or Non-Latinx	650 (95.9%)
Shift Length	
8 hours	178 (26.7%)
9-10 hours	122 (18.3%)
12 or more hours	367 (55%)
Total Years of Experience	
<1 year	13 (1.9%)
1-4 years	97 (14.3%)
5-10 years	155 (22.9%)
11-20 years	188 (27.7%)
21+ years	225 (33.2%)
Years in Current Position	
<1 year	94 (13.8%)
1-4 years	269 (39.4%)
5-10 years	153 (22.4%)
11-20 years	112 (16.4%)
21+ years	54 (7.9%)
Clinical Population	
Practices with adults	337 (49.3%)
Practices with pediatrics	243 (35.6%)
Practices with both	103 (15.1%)
Clinical Setting	
Inpatient	506 (74.1%)
Outpatient	177 (25.9%)

CESD-10 Depression Score	9.5 ± 5.4
Positive emotions score	1.9 ± 0.8
Well-being behaviors score	1.8 ± 1.1
Work-life integration score	57.4 ± 21
Latent Profile Indicators	
Burnout: Emotional exhaustion score (Q1-Q5)	56.2 ± 26.4
Resilience: Emotional thriving score (Q6-Q9)	67.5 ± 21.9
Resilience: Emotional recovery score (Q10-Q13)	67.2 ± 21.3

N=Available Data; n of N (%) reported for categorical measures. Mean ± Standard Deviation reported for continuous scores. Race: Other Minorities=Asian, Native Hawaiian or Pacific Islander, American Indian or Alaska Native

3.3.2 LPA: Identified Profiles

The LPA was conducted to identify the best possible number of profiles. Three LPA indicators were included in the models: (1) emotional exhaustion, (2) emotional thriving, and (3) emotional recovery. Fit statistics used to determine the optimal number of profiles are summarized in Table 5. We assessed four different profile options starting with a two-profile solution following an iterative process that advanced to a five-profile solution. The four-profile solution was best as evidenced by a statistically significant VLMR p-value ($p=0.0188$) with the following five-profile solution yielding a non-statistically significant VLMR p-value ($p=0.1525$). Entropy was highest in the three and four-profile models (Entropy=0.742 and 0.738 respectively). Although the entropy of 0.738 for the best fitting model is slightly below the often recommended cutoff of 0.80 (Muthén, 2017; Spurk et al., 2020), the value indicates adequate separation between the profiles. Thus, the optimal model was the four-profile solution.

Table 5 Latent Profile Analysis (LPA): Model Fit Information for the Number of Specified Latent Profile

Profiles	Number of Parameters	Log-likelihood	AIC	BIC	ssBIC	Entropy	VLMR	BLRT	Size of smallest profile, n (%)
2	10	-9180.690	18381.381	18426.646	18394.894	0.636	p=0.1173	p=0.0000	340 (49.8%)
3	14	-9105.415	18238.829	18302.200	18257.748	0.742	p=0.0000	p=0.0000	103 (15.1%)
4	18	-9086.735	18209.470	18290.947	18233.794	0.738	p=0.0188	p=0.0000	43 (6.3%)
5	22	-9072.357	18188.715	18288.298	18218.445	0.678	p=0.1525	p=0.0000	48 (7.0%)

Note. AIC=Aikake information criteria; BIC=Bayesian information criteria; ssBIC=sample size adjusted Bayesian information criteria; VLMR=Vuong-Lo-Mendell-Rubin likelihood ratio test; BLRT=parametric bootstrapped likelihood ratio test.

3.3.3 Description of Latent Profiles

The four profiles of nurses represent four distinct subgroups (see figure 3). Table 6 presents the descriptive statistics for each latent profile. The four profiles were labelled to capture the essence of the three indicators (e.g., emotional exhaustion, emotional thriving, and emotional recovery) based on their respective levels. The mean overall score for each indicator had a possible range of 0 to 100, with higher scores indicating higher level of the indicator. For each indicator, the following descriptors were used to classify the mean overall scores: very low (0-20), low (21-30), low-moderate (31-40), moderate (41-60), moderate-high (61-70), high (71-79), and very high (80-100).

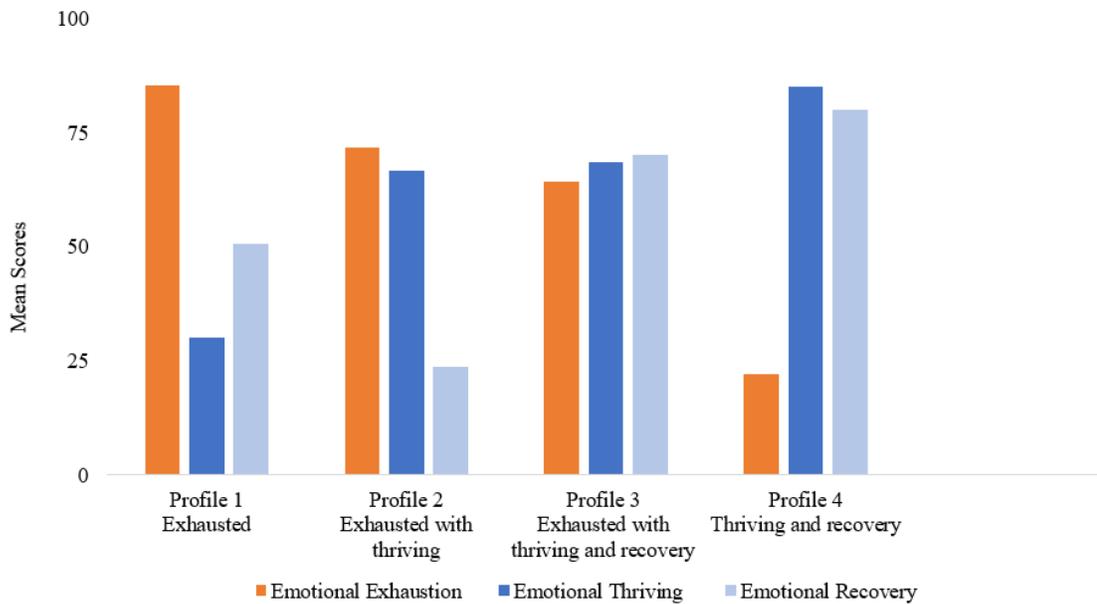


Figure 3 *Emotional Exhaustion, Emotional Thriving, and Emotional Recovery for the Four Latent Profiles*

The first profile (“exhausted,” $n=96$, 14.1%) included those with very high emotional exhaustion, low emotional thriving, and moderate emotional recovery. The second profile (“exhausted with thriving,” $n=43$, 6.3%), was the smallest subgroup and represented nurses with high emotional exhaustion, moderate-high emotional thriving, and low emotional recovery. The third profile (“exhausted with thriving and recovery,” $n=358$, 52.4%) was the largest subgroup and included nurses with moderate-high levels of emotional exhaustion, emotional thriving, and emotional recovery. The fourth profile (“thriving and recovery,” $n=186$, 27.2%) represented nurses with low emotional

exhaustion, very high emotional thriving, and very high emotional recovery. Table 3 provides descriptive statistics for emotional exhaustion, emotional thriving, and emotional recovery within each profile.

Table 6 *Latent Profile Analysis Indicators*

Indicator	Profile 1 Exhausted <i>n</i> =96 (14%)	Profile 2 Exhausted with thriving <i>n</i> =43 (6%)	Profile 3 Exhausted with thriving and recovery <i>n</i> =358 (52%)	Profile 4 Thriving and recovery <i>n</i> =186 (27%)	
Emotional Exhaustion	Very high	High	Moderate-high	Low	
Emotional Thriving	Low	Moderate-high	Moderate-high	Very high	
Emotional Recovery	Moderate	Low	Moderate-high	Very high	
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	
Emotional Exhaustion	85.5 ± 12.9	71.7 ± 17.3	64.3 ± 15.1	22.0 ± 13.1	
Emotional Thriving	30.1 ± 13.8	66.6 ± 12.6	68.5 ± 14.8	85.2 ± 12.9	
Emotional Recovery	50.6 ± 19.6	23.8 ± 10.6	70.1 ± 14.8	80.2 ± 16.3	
	F (<i>df1, df2</i>)	p-value	η ²	η ² 95% CI	<i>A posteriori</i> Pairwise Contrasts
Emotional Exhaustion	534.56 _(3, 679)	<.0001	0.70	0.67, 0.73	p1 > p2 > p3 > p4
Emotional Thriving	328.50 _(3, 679)	<.0001	0.59	0.55, 0.63	p4 > (p3=p2) > p1
Emotional Recovery	190.58 _(3, 679)	<.0001	0.46	0.40, 0.50	p4 > p3 > p1 > p2

ANOVA results demonstrated statistically significant profile differences in the mean overall scores for each LPA indicator (all profile effects: $p < 0.0001$, table 6). Eta-

squared (η^2) for each ANOVA model indicated large effects (all profile effects: $\eta^2 > 0.14$, range of 0.46 to 0.70). Emotional exhaustion was statistically significantly higher in the “exhausted” profile, followed by “exhausted with thriving,” “exhausted with thriving and recovery,” and “thriving and recovery” (all contrasts, $p \leq 0.05$). Emotional thriving was significantly highest in the “thriving and recovery” profile, followed by the “exhausted with thriving and recovery” and “exhausted with thriving” profiles, and “exhausted” (all contrasts, $p \leq 0.05$, except both “exhausted with thriving and recovery” and “exhausted with thriving” profile had moderate-high levels of thriving and did not statistically differ from each other. Emotional recovery was also significantly higher in the “thriving and recovery” profile, followed by the “exhausted with thriving and recovery,” “exhausted,” and “exhausted with thriving” profile (all contrasts, $p \leq 0.05$).

3.3.4 LPA Profile Differences in Nurse Characteristics

Figure 4 and Table 7 presents the profile differences in nurse characteristics (see also Appendix A, supplementary figure 2). Latent profile was associated with race ($p=0.0467$, Cramer’s $V=0.11$, small effect) and clinical setting ($p=0.0501$, Cramer’s $V=0.11$, small effect). Specifically, *A posteriori* contrasts to test for profile differences in race indicated that the “thriving and recovery” profile relative to the “exhausted with thriving” profile had a significantly higher percent of racial minorities groups (14.1% vs 2.4%, Fisher’s Exact, $p=0.0345$), while the other profiles did not differ from one another.

Further, the “exhausted” profile (83.3%) had a significantly higher percent of nurse working in an inpatient clinical setting compared to “exhausted with thriving” (65.1%, $\chi^2=5.69$, $df=1$, $p=0.0171$) and “exhausted with thriving and recovery” (71.5%, $\chi^2=5.50$, $df=1$, $p=0.0190$).

Table 7 *Latent Profile Differences in Nurse Characteristics: Bivariate Relationships (N=683)*

Characteristics	Exhausted	Exhausted with thriving	Exhausted with thriving and recovery	Thriving and recovery	p-value	Cramer's V	<i>A posteriori</i> Pairwise Contrasts
	Profile 1 N=96	Profile 2 N=43	Profile 3 N=358	Profile 4 N=186			
Sociodemographic and Professional Characteristics	n (%)	n (%)	n (%)	n (%)			
Male Gender	4 (4.2%)	2 (4.7%)	17 (4.8%)	12 (6.5%)	0.8187*	0.04	
Minority race	6 (6.3%)	1 (2.4%)	31 (8.7%)	26 (14.1%)	0.0467*	0.11	p4 > p2
Hispanic/Latinx	3 (3.2%)	4 (9.3%)	13 (3.7%)	8 (4.4%)	0.3332*	0.07	
Adult clinical population	46 (47.9%)	23 (53.5%)	182 (50.8%)	86 (46.2%)	0.7027	0.05	
Pediatric clinical population	35 (36.5%)	16 (37.2%)	116 (32.4%)	76 (40.9%)	0.2700	0.08	
Adult and pediatric population	15 (15.6%)	4 (9.3%)	60 (16.8%)	24 (12.9%)	0.4916*	0.06	
Inpatient clinical setting	80 (83.3%)	28 (65.1%)	256 (71.5%)	142 (76.3%)	0.0501	0.11	p1 > (p2=p3)
Shift length: 12+ hours	54 (56.8%)	21 (51.2%)	188 (53.7%)	104 (57.5%)	0.7909	0.04	
11+ years of current experience	23 (24%)	15 (34.9%)	79 (22.1%)	49 (26.5%)	0.2539	0.08	
11+ years of professional experience	56 (59%)	26 (60.5%)	209 (58.9%)	122 (66%)	0.4324	0.06	

Psychological Characteristics	M ± SD	M ± SD	M ± SD	M ± SD	p-value	η^2 (95% CI)	
CESD-10 depression score	14.9 ± 5.5	15.0 ± 5.0	9.2 ± 4.4	5.9 ± 3.5	<.0001	0.34 (0.28, 0.39)	(p1=p2)>p3 >p4
Positive emotion score	1.2 ± 0.6	1.4 ± 0.5	1.9 ± 0.7	2.3 ± 0.8	<.0001	0.20 (0.15, 0.25)	p4 > p3 > (p2=p1)
Well-being behaviors score	1.5 ± 1.2	1.4 ± 1.1	1.8 ± 1.1	2.0 ± 1.2	<.0001	0.03 (0.01, 0.06)	p4 > p3 > (p1=p2)
Work-life integration score	42.4 ± 20.2	48.6 ± 20.1	56.1 ± 19.7	69.5 ± 17.0	<.0001	0.18 (0.12, 0.22)	p4 > p3 > (p2=p1)

Note: For sociodemographic and professional characteristics, 4 x 2 chi-square tests performed, except for Fisher's Exact Test denoted by *. For years of current and professional experience, 11+=11 years or greater. For psychological characteristics, a one-way ANOVA using a GLM approach was performed. Cramer's V effect sizes cutoffs for df=3: 0.06=small, 0.17=medium, 0.29=large effects. η^2 =eta-squared effect size: 0.01=small, 0.06=medium, 0.14=large effects; CI=Confidence Interval. *A posteriori* pairwise contrasts using chi-square tests for categorical measures and least squares means t-tests for continuous measures.

Latent profile was associated with psychological characteristics, namely depression, positive emotions, well-being behaviors, and work-life integration (all $p < .0001$, table 7). The η^2 for each model indicated large effects for each characteristic ($\eta^2 > 0.14$, range of 0.18 to 0.34), with the exception that a small effect was observed for the well-being behaviors ($\eta^2 = 0.03$). Higher mean depression scores were observed in “exhausted” profile and “exhausted with thriving” profiles, followed by the “exhausted with thriving and recovery” and “thriving and recovery” (all contrasts, $p \leq .05$, except “exhausted” and “exhausted with thriving” profiles did not differ). The mean positive emotions, well-being behaviors, and work-life integration scores were all significantly higher in the “thriving and recovery” profile, followed by the “exhausted with thriving and recovery” (all $p < 0.05$) and both profiles significantly differed from “exhausted with thriving” and “exhausted” (all $p < 0.05$). However, the latter two profiles did not differ from one another on the latter characteristics.

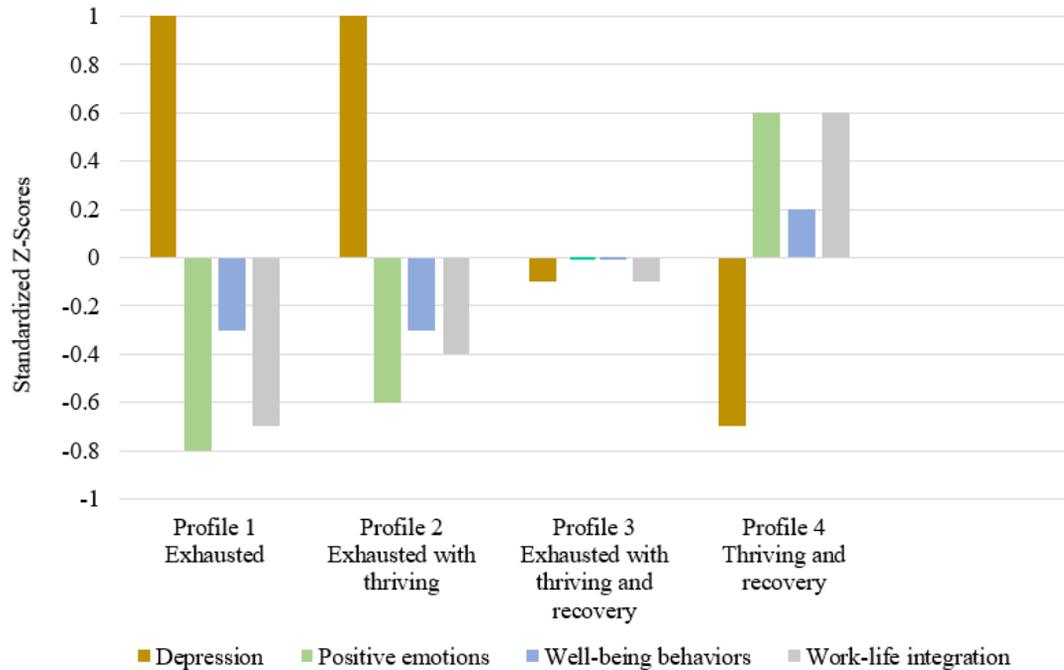


Figure 4 *Characterization of the Latent Profiles: Psychological Measures*

3.4 Discussion

The purpose of this study was to move beyond current dominant thinking of burnout and resilience as being opposite experiences of well-being. We identified four distinct subgroups of nurses based on their levels of burnout (emotional exhaustion) and resilience (emotional thriving and emotional recovery) that included: “exhausted,” “exhausted with thriving,” “exhausted with thriving and recovery,” and “thriving and

recovery.” Importantly, our study also identified unique features of nurses associated with each profile.

The “exhausted” profile and “thriving and recovery” profile reflected inverse scores between burnout (emotional exhaustion) and resilience (emotional thriving and emotional recovery) with higher burnout/lower resilience and higher resilience/lower burnout respectively. Consistent with the burnout and resilience literature (Adair et al., 2020; Guo et al., 2018), findings from the present study demonstrate the intuitive co-occurrence of burnout and resilience. Our findings showed the “exhausted” profile is representative of nurses with more severe burnout who might not have the resources to thrive and are only moderately able to recover from challenges. Nurses with high burnout and low resilience might benefit from bite-sized well-being interventions designed to be simple, easy to do, and accessible (Adair et al., 2020). Alternatively, nurses who have higher resilience and lower burnout could serve as well-being ambassadors, offering social, emotional and logistical support around well-being interventions for their fellow nurses who are struggling with burnout. Although the “exhausted” and “thriving and recovery” profiles represent predominant thinking around the inverse relationship between burnout and resilience, these profiles collectively only represented 41% of the sample.

Our findings demonstrated that emotional exhaustion can co-occur with other aspects of resilience. For instance, 52% of our sample resided in the “exhausted with thriving and recovery” profile, where nurses had moderate-high levels of emotional exhaustion, emotional thriving, and emotional recovery. These findings, though less common in the nursing literature, were similar to findings from recent study where 29% of the physicians who had top resilience scores also had burnout (West et al., 2020). At this stage in the research, there is much that we do not know about the overlap between burnout and resilience across healthcare workers. Additional research is needed to determine the degree to which resilience is protective against burnout and if so, inform development and testing of interventions designed to increase resilience rather than solely decrease burnout. Moreover, interventions should simultaneously target the reduction of burnout and the improvement of resilience – in other words, improve well-being overall.

While mean emotional thriving and emotional recovery scores tended to track closely with one another in most profiles, there is a notable difference between emotional thriving and emotional recovery scores in the “exhausted with thriving” profile. This small subgroup of nurses (N=43, 6%) had both high levels of emotional exhaustion coupled with moderate-high levels of emotional thriving and low emotional recovery. These findings emphasize the unique features of emotional thriving and

emotional recovery (i.e., the presence of strong thriving does not ensure the presence of strong recovery) (Adair et al., 2020). One possibility of this profile is that nurses who are passionate about their work and thus thriving, may also be drained and unable to recovery efficiently without the appropriate organizational supports in place. If this is correct, this subgroup may benefit from interventions targeting the cause of emotional exhaustion, which is often at the system-level such as high workload (NASEM, 2019). Additionally, simple brief interventions targeting well-being such as those designed to enhance gratitude and other positive emotions (Adair et al., 2020) could be prioritized to prevent nurses from diminishing further in their recovery or their thriving.

Nurses in our sample exhibited unique psychological characteristics across each profile including depression. Higher depression scores in the profiles with higher emotional exhaustion relative to emotional thriving and emotional recovery (profiles 1 and 2). These findings are similar to other studies that have found a positive correlation between burnout and depression (Rehder et al., 2021; Rehder et al., 2020). Positive psychology tools are a promising intervention for nurses experiencing depression. In a study of HCWs who engaged in positively reflecting forward (the looking forward tool), there were clinically important improvements in depression and emotional recovery scores observed between baseline and one week and at 28 days (Adair et al., 2020). Another study of healthcare workers who reflected back on three good things daily over

15 days found clinically important improvements in depression across one, six, and 12 months (Sexton & Adair, 2019).

We found the nurses with profiles having higher levels of both emotional thriving and emotional recovery reported significantly higher levels of positive emotions than those with lower levels of either emotional thriving and/or emotional recovery, consistent with prior research (Cohn et al., 2009). One possible mechanism to explain how positive emotions relate to resilience is through the notion that positive emotions encourage the building of resources (Fredrickson et al., 2008; Fredrickson & Joiner, 2018; Tugade & Fredrickson, 2004). Positive emotions have been demonstrated to be an important component in facilitating cardiovascular recovery from a negative experience among resilient individuals (Tugade & Fredrickson, 2004). A recent randomized controlled trial designed to increase positive emotions using a brief intervention among healthcare workers demonstrated clinically meaningful improvements in emotional exhaustion, depression, and work-life balance (Profit et al., 2021). Given the utility of positive emotions, nurses may benefit from brief interventions that have been tested among healthcare workers and designed to cultivate various positive emotions such as gratitude, compassion, hope, and social connection (Profit et al., 2021; Rehder et al., 2021).

Nurses who reported more well-being behaviors were in the profiles with higher emotional thriving and emotional recovery which is consistent with recent research that found healthcare workers who engage in more well-being behaviors also have greater levels of emotional thriving and emotional recovery (Rink et al., 2021). These findings can be used to create tailored interventions that aim to boost emotional thriving and emotional recovery for nurses.

Nurses had poorer work-life integration scores in the profiles with higher levels of emotional exhaustion and better work-life integration scores in the profiles with lower emotional exhaustion. Research has identified that healthcare workers with poorer work-life balance also report burnout (Schwartz et al., 2019). More research is needed to determine the best approach to address poor work-life integration. Potential interventions must include system-level changes that address nurse patient ratios and inefficient work processes such as burdensome charting requirements. However, recent evidence shows that work culture, including the domains of commitment, belonging, safety, teamwork, and work-life integration is more closely associated with burnout than electronic health record (EHR) usage, by a wide margin (McPeck-Hinz et al., 2021). To this end, interventions should also address unhealthy work cultures that perpetuate nurses providing patient care at the expense of their own well-being (e.g., skipping

meals and not taking breaks). Providing excellent patient care and maintaining well-being need not be mutually exclusive.

The profile subgroups also included distinct sociodemographic of race. Despite the small effect sizes for profile differences in race, these findings are clinically important for tailoring interventions designed to focus on racial minority groups. Our finding that the “thriving and recovery” profile had a higher percentage of racial minority groups relative to the “exhausted with thriving” profile is consistent with research that observed Black/African American HCWs had significantly higher scores of emotional thriving and emotional recovery than White healthcare workers (Rink et al., 2021). Additionally, Rink et al., (2021) found that all racial minorities groups had higher scores of emotional recovery scores compared to White healthcare workers. Similarly, racial minority groups of medical students reported lower burnout compared to non-racial minority groups of students (Dyrbye et al., 2007). Notably, however, racial minority groups of medical students who reported challenges in medical school related to their race were more likely to experience burnout than those racial minority groups of students who did not report these challenges (Dyrbye et al., 2007). Similarly, Byers et al., (2021) found that nurses with higher perceived race-related stress had lower resilience. Future study should continue assessing nurses’ experience of race and race-related stress in the workplace and its relationship to burnout and resilience.

Our findings that the “exhausted “ profile had a higher percentage of nurses working in the inpatient setting relative to the “exhausted with thriving” and “exhausted with thriving and recovery” profiles is consistent with a recent study that found nurse attrition was more likely due to burnout if the nurses had worked in the hospital setting or other inpatient setting rather than the clinic setting (Shah et al., 2021). Future studies should target the challenging aspects of inpatient nurses’ work environment given the findings of another study regarding the influence of various aspects of the hospital work environment (i.e., leadership and nurse management capability and support, staffing and resource availability, relationships with physicians, and care quality) and poor patient outcomes (i.e., mortality and length of stay) (Schlak et al., 2021).

3.4.1 Limitations

This study is among the first to examine profiles of burnout and resilience among nurses using the LPA approach, which allowed us to look for meaningful patterns among nurses rather than looking at patterns across variables (Ferguson et al., 2020). Additional strengths include a large sample size, a diverse set of well-being correlates and robust set of nurse characteristics to assess relationships with identified subgroups. However, this study is not without limitations. Using convenience sampling, the WISER study has recruited a large sample of HCWs representing a wide range of healthcare

positions and work settings. However, the representativeness of nurses and other HCWs in the WISER study should be further examined to ensure generalizability. Larger sample sizes could be used to assess whether similar profiles are replicated.

Additionally, due to the small sample size of 43 in the second profile, years of current experience and years of professional experience were collapsed into two categories spanning less than six months to 21 years or more thus limiting our ability to assess experience at a more detailed level across the profiles. Finally, our study used pre-pandemic data; however, nurse burnout rates were at already high levels prior to the start of the Covid-19 pandemic (Dyrbye et al., 2019), and the generalizability of the related pandemic events may be limited (Munn et al., 2022).

3.4.2 Conclusion

Burnout and resilience are not mutually exclusive characteristics as nurses in this sample had co-occurring emotional exhaustion, emotional thriving and emotional recovery at varying levels. Importantly, nurses with greater resilience (emotional thriving and emotional recovery), in the setting of both moderate-high and low burnout (emotional exhaustion), had favorable psychological characteristics (e.g., low depression, high positive emotions, more well-being behaviors, and high work-life balance scores) suggesting that strategies to increase well-being that include thriving and recovery will play an important role in the armamentarium of nurse well-being interventions.

Chapter 4. The Association Between Well-being Behaviors and Resilience in Health Care Workers

(Rink, Silva, Adair, Oyesanya, Humphreys, & Sexton, 2021)

4.1 Introduction

Health care worker (HCW) burnout and resilience are receiving national attention with organizations such as the National Academy of Medicine (NAM) conducting formal initiatives on these subjects (National Academies of Science, Engineering and Medicine [NASEM], 2019). The motivation for studying HCW resilience, a more positively framed approach to addressing HCW burnout, is rooted in the unsustainable levels of burnout among HCWs. High levels of HCW burnout in the United States (U.S.) are a significant problem for both patients and HCWs (NASEM, 2019). Burnout is defined as ongoing and unmitigated stress that results in symptoms of emotional exhaustion, depersonalization, and a decreased sense of personal accomplishment (World Health Organization, 2019). Research shows nearly 44% of physicians (Shanafelt et al., 2019) and 35% of nurses (Dyrbye et al., 2019) experience at least one burnout symptom. Burnout is associated with lower patient satisfaction (McHugh et al., 2011), higher rates of infection (Cimiotti et al., 2012), medical errors (Melnyk et al., 2018), and patient mortality (Aiken et al., 2002). Therefore, burnout is not without consequence.

Research shows increasing resilience in HCWs can be a way to safeguard against the effects of burnout (Adair et al., 2020a; Guo et al., 2018; Matheson et al., 2016). Resilience involves a process of recovery from adversity or stress while also providing an opportunity for further personal growth and positive adaptation (American Psychological Association [APA], 2020). Two of the main resilience paths are recovery and thriving (Szanton & Gill, 2010). Recovery is characterized as a return to baseline functioning after experiencing “diminished functional capacity” from the challenge or adversity (Szanton & Gill, 2010, p. 330). Thriving, on the other hand, takes a positive trajectory from a challenge or adversity, whereby the HCW grows beyond their previous baseline (Szanton & Gill, 2010). Emotions are a central component in building capacity for recovery and thriving. In particular, positive emotions can serve as fuel for the resilience growth process (Tugade & Fredrickson, 2004). As such, the two components of emotional recovery and emotional thriving serve as the two constructs representing resilience in this study. The term “resilience” is commonly used in psychological science but has acquired a negative connotation of blame among some HCWs, i.e., “your problem is that you are not resilient enough” (Balme et al., 2015) or the expectation that HCWs must “compensate for the fundamental fissures in the health care system” (Rushton & Pappas, 2020, p. 143). We recognize that system level issues are a predominant contributor of burnout (NASEM, 2019), and we regard resilience as one of

many components in addressing HCW burnout. Individual-level strategies are particularly important as HCWs endure stress during the Covid-19 pandemic (Dzau et al., 2020; Lai et al., 2020) that needs to be deployed promptly while longer-term strategies are addressed. Of additional note, a negative relationship between resilience and burnout has been shown in research (Guo et al., 2018). However, physicians with burnout symptoms have also reported high resilience (West et al., 2020). Less is known of this nonreciprocal relationship between resilience and burnout in nurses, though the current research on physicians suggests that high resilience does not necessarily equate to low burnout.

The construct of resilience has evolved from being regarded as a static trait to one that can be strengthened with intentional practices and supports (APA, 2020; Jackson et al., 2007; O'Dougherty-Wright et al., 2013). Theory also supports the notion that resilience is "both a process and a capacity" that can be strengthened at multiple levels, including individual focused strategies (Szanton & Gill, 2010, p. 332). Engaging in well-being behaviors may be one such individual level strategy that theoretically may fuel the process of resilience and strengthen resilience capacity (Szanton & Gill, 2010). Research has demonstrated that well-being behaviors such as exercise (Guo et al., 2018; Oskrochi et al., 2016; Shanafelt et al., 2012; Yang et al., 2018), relationships with family and friends (Rippstein-Leuenberger et al., 2017; Thompson et al., 2016; Wang et al.,

2018), meditation (Gauthier et al., 2015; Goodman & Schorling, 2012; Muir & Keim-Malpass, 2020; van der Riet et al., 2018), yoga (Alexander et al., 2015), going on vacations (Shanafelt et al., 2012), and reflecting on the positive things in life (Sexton & Adair, 2019) are associated with lower burnout or higher resilience. Current research often assesses well-being behaviors separately from one another (Cleary et al., 2018; Joyce et al., 2018) or with focus on certain HCW groups (Lebensohn et al., 2013; Shanafelt et al., 2012). However, limited research has been conducted to investigate the total number and types of well-being behaviors that various groups of HCWs are collectively engaged in and their association with resilience.

4.2 Purpose

Understanding the type and total number of well-being behaviors related to resilience could help researchers develop resilience-enhancing tools for HCWs. The purpose of this study was to explore the relationship of well-being behaviors with resilience in HCWs as a first step in developing future interventions to enhance resilience among HCWs. Two aspects of resilience were examined, emotional thriving and emotional recovery. Emotional thriving assessed HCWs' ability to flourish while emotional recovery assessed HCWs' capacity to bounce back from difficulties (Adair et al., 2020a). The aims of this study were to (a) identify types of well-being behaviors associated with emotional thriving and emotional recovery and (b) determine the

relationship between total number of well-being behaviors with emotional thriving and emotional recovery, covarying for sociodemographic and professional characteristics of the HCWs.

4.3 Methods

4.3.1 Design

This descriptive, correlational study was a secondary analysis of baseline data from HCWs enrolled in the Web-based Implementation of the Science for Enhancing Resilience (WISER) longitudinal study (R01 HD084679-01, Co-PI: Sexton, J. B.). The participating institutional review board approved this study prior to initiation of the WISER longitudinal study and the analysis of the baseline data.

4.3.2 Sample and Setting

The sample included U.S. HCWs ($N = 2,383$) enrolled in the WISER study (R01 HD084679-01, Co-PI: Sexton, J. B.) with resilience data who completed the baseline survey between June 1, 2018 and April 24, 2019. The WISER data- set is comprised of responses from U.S. HCWs age 18 years or older. HCWs were recruited from a wide variety of health care systems, hospitals, and clinics across the United States through educational webinars, web links, and attending scientific presentations given by the third and last authors. Data were collected electronically via Qualtrics and stored on a secure server.

4.3.3 Measures

Participants reported sociodemographic and health care professional characteristics. Sociodemographic measures were sex, race, and ethnicity. There were five options for race that were collapsed in the following categories: White, Black/African American, and other minorities (Asian, Native Hawaiian or other Pacific Islander, American Indian or Alaska Native). Ethnicity included Hispanic/Latinx or non-Hispanic/non-Latinx.

Professional characteristics included HCW role, shift length, total years of professional experience, years in current position, work department, clinical population, and clinical setting. HCW role included 23 positions that were collapsed into five categories: (1) nurse (registered nurse, nurse manager, charge nurse), (2) physician (attending/staff medical doctor, fellow physician, resident physician), (3) physician assistant or nurse practitioner, (4) other HCWs (clinical support/nurse assistant, clinical social worker, chaplain/clergy, dietician/nutritionist, occupational therapist, pharmacist, physical therapist, speech therapist, respiratory therapist, technologist/technician, EMT-B, paramedic), and (5) other (administrative support, environmental support, other manager, student, and those who selected other).

Shift length included 8 hours, 10 hours, 12 hours, 24 hours, and other with the smaller frequency of 24 hours combined into the other category. Total years of

professional experience and years in current position included seven options that were collapsed into five categories: (1) <1 year, (2) 1–4 years, (3) 5–10 years, (4) 11–20 years, and (5) 21+ years. Work department included 16 options that were collapsed into seven categories: (1) emergency medicine, (2) critical care, (3) family & internal medicine, (4) anesthesiology and surgery, (5) obstetrics and gynecology, (6) pediatrics, and (7) other (not applicable, neurology, physical medicine, and rehabilitation, preventative medicine, psychiatry, radiology, urology, and other). Clinical population included those who practice with adults, pediatrics, or both, and not applicable. Clinical setting options included inpatient, outpatient, and not applicable.

HCWs were asked to select well-being behaviors they had engaged in over the last month. The response options were as follows: (1) regular exercise, (2) yoga, (3) meditation, (4) spent time with a close friend, (5) vacation, and (6) other. A version of this item using an open-ended response was used in prior exploratory research by the last author. The most frequently identified responses (e.g., regular exercise, yoga, meditation, spent time with a close friend, and vacation) were selected as options for this survey in addition to the “other” option. The selection of “other” and the related open-ended responses were not included in this analysis; however, an overview of the self-reported “other” well-being behaviors are included in the descriptive results. Engaging in each type of well-being behavior was coded either no (0, not selected) or yes (1,

checked). A total score (ranging from 0 to 5) was derived by summing the types of well-being behaviors endorsed.

Resilience was measured using eight-items, including the emotional thriving subscale (items 1–4) and the emotional recovery subscale (items 5–8). Both of these scales were created and psychometrically tested by the third and last author (Adair et al., 2020a). Established resilience metrics are not currently well-suited for HCWs because they are either long (e.g., 25 items; Wagnild, 2009), focused exclusively on the “bounce back” aspect of resilience and do not assess the thriving aspect of resilience (e.g., Smith et al., 2008), or include items that cover a broad range of resilience related concepts beyond that of thriving and recovery (e.g., Connor & Davidson, 2003). To address the need for brief, appropriate, and psychometrically valid metrics for HCWs, the Emotional Resilience scales were developed as a part of the NIH funded research on HCW resilience awarded to the last author. Items were piloted in other samples to establish psychometric validity and used in prior research (Adair et al., 2020a). Each item was rated on a 5-point Likert-type scale (1 = disagree strongly, 2 = disagree slightly, 3 = neutral, 4 = agree slightly, 5 = agree strongly). Each subscale score was the average of the four items, with higher scores indicating greater resilience. The emotional thriving subscale (current study Cronbach α = 0.81) assessed the HCW level of flourishing (e.g., “I feel like I am thriving at my job”) (Adair et al., 2020a). The emotional recovery subscale

(current study Cronbach α = 0.82) assessed the ability to bounce back from difficulties (e.g., “I always bounce back quickly after difficulties”) (Adair et al., 2020a). Emotional thriving and emotional recovery were the primary outcomes for this analysis.

4.3.4 Data Analysis

Sample characteristics and a description of key study measures were provided using descriptive statistics. All statistical tests were nondirectional and had a significance level set at 0.05. Effect sizes and their 95% confidence intervals (CIs) were calculated to address clinical relevance. All analyses were performed using SAS 9.4.2[®] software (SAS Institute, Inc., 2015).

General linear models (GLM) were used to examine the association of types of well-being behaviors as well as total number of well-being behaviors in the last month with emotional thriving and emotional recovery scores. First, bivariate analysis of variance models were conducted to (a) examine the relationship of each type of well-being behaviors with emotional thriving and emotional recovery scores and (b) examine the relationship of total number of well-being behaviors with emotional thriving and emotional recovery scores. Next, an analysis of covariance was conducted to further examine these relationships after adjusting for ten covariates in the model. Covariates are as follows (1) sex, (2) race, (3) ethnicity, (4) HCW role, (5) shift length, (6) total years of professional experience, (7) years in current position, (8) work department, (9) clinical

population, and (10) clinical setting. These sociodemographic and professional characteristics were selected as covariates due to their possible relationship with HCW resilience and/or burnout (Dyrbye et al., 2007, 2017; Shanafelt et al., 2012, 2019; Templeton et al., 2019; Walsh, 2013). The full multivariable model for emotional thriving/recovery included all five well-being behaviors and ten covariates. An iterative backward elimination approach was used to reduce each full model to a final parsimonious model that included the five well-being behaviors and only those covariates significant at the $p \leq .05$ level. The aforementioned bivariate and covariate-adjusted approach was also applied when evaluating the relationship of total number of well-being behaviors with emotional thriving and emotional recovery.

The *a priori* power calculation indicated that the sample size of 2,383 would provide at least 80% statistical power to detect an association of each well-being behaviors or total number of well-being behaviors with emotional thriving and emotional recovery using a GLM adjusting for ten covariates, assuming small effect sizes (eta squared of 0.01) and significance set at $p \leq .05$ for each two-tailed test.

4.4 Results

4.4.1 Sample Characteristics

Table 8 summarizes the characteristics for the 2,383 HCWs. The sample was primarily female (82.3%), White (87%), and non-Hispanic/non-Latinx (94.8%). Most were

nurses (31.9%) and physicians (20.9%), and most reported working 8-hour shifts (39%), followed by 12-hour shifts (28.4%). The category of total years professional experience with the highest percentage was 21 or more years (35.2%) while the category of years in current position with the highest percentage was 1 to 4 years (37.8%). HCWs worked in a variety of departments including pediatrics (13.5%), critical care medicine (8.9%), emergency medicine (7.3%), or in the other category (54.9%). HCWs primarily worked in the inpatient setting (48.8%) followed by those that reported working in the outpatient setting (31.7%).

Table 8 Sample Characteristics (N=2383)

Characteristic	n (%)
Sex	
Female	1936 (82.3%)
Male	417 (17.7%)
Race	
White	2056 (87.0%)
Black/African American	111 (4.7%)
Other Minorities	195 (8.3%)
Ethnicity	
Hispanic/Latinx	122 (5.2%)
Non-Hispanic/Non-Latinx	2233 (94.8%)
Healthcare worker role	
Nurse	759 (31.9%)
Physician	498 (20.9%)
Physician Assistant or Nurse Practitioner	107 (4.5%)
Other healthcare workers	388 (16.3%)
Other	629 (26.4%)
Shift Length	
8 hours	869 (39.0%)
10 hours	539 (24.2%)
12 hours	633 (28.4%)
Other	189 (8.5%)
Total Years of Experience	
<1 year	64 (2.7%)
1-4 years	315 (13.4%)
5-10 years	497 (21.1%)
11-20 years	651 (27.6%)
21+ years	828 (35.2%)
Years in Current Position	

<1 year	375 (15.9%)
1-4 years	893 (37.8%)
5-10 years	501 (21.2%)
11-20 years	388 (16.4%)
21+ years	206 (8.7%)
Department	
Emergency Medicine	169 (7.3%)
Critical Care Medicine	206 (8.9%)
Family and Internal Medicine	170 (7.4%)
Anesthesiology and Surgery	94 (4.1%)
OB/Gyn	89 (3.9%)
Pediatrics	311 (13.5%)
Other	1264 (54.9%)
Clinical Population	
Practices with Adults	924 (39.4%)
Practices with Pediatrics	643 (27.4%)
Practices with Both	422 (18.0%)
Not Applicable	359 (15.3%)
Clinical Setting	
Inpatient	1137 (48.8%)
Outpatient	738 (31.7%)
Not Applicable	454 (19.5%)

Race: Other Minorities=Asian, Native Hawaiian or Pacific Islander, American Indian or Alaska Native; Healthcare worker role: other healthcare workers=clinical support/nurse assistant, dietician/nutritionist, pharmacist, technologist/technician, clinical social worker, chaplain, respiratory therapist, physical therapist, speech therapist, occupational therapist, EMT-B, paramedic; and other=environmental support, other manager, administrative support, student, and those who selected "other"; Shift length: Other=24 hours and "other"; Department: Other=Neurology, Physical Medicine & Rehabilitation, Preventative Medicine, Psychiatry, Radiology, Urology, not applicable and "other"

4.4.2 Well-being Behaviors and Resilience

Table 9 summarizes the characteristics of well-being behaviors and resilience scores among HCWs. The most common types of well-being behaviors HCWs reported engaging in over the last month was spending time with a close friend (65.5%) and exercise (52%) followed by vacation (32.7%), meditation (24.3%), and yoga (14.9%). On average, participants reported engaging in 1.9 of the five well-being behaviors. The mean score for the emotional thriving and emotional recovery subscales were both 3.7,

with each subscale score ranging from 1 to 5. In addition to the five well-being behaviors (regular exercise, yoga, meditation, spent time with a close friend, vacation), participants provided open-ended responses for engaging in other activities related to well-being. HCWs often mentioned variations of the five well-being behavior options including, "time with family," "a day off," "not really vacation," or qualifying the type or amount of self-reported exercise, e.g., "walking" or "intermittent exercise." Additionally, contemplative and spiritual practices including "prayer," "attending church," "Qigong," "Tai Chi," "quiet time with God," and "reflective journaling" were included in the responses. Finally, a variety of self-care activities such as "counseling," "alone time," and "getting a massage" or hobbies such as "gardening," "fishing," and "quilting" were provided.

Table 9 *Well-being Behaviors and Resilience: Descriptive Statistics (N=2383)*

Characteristic	N	n	%	M	SD
Well-being Behaviors	2383				
Exercise		1239	52.0%		
Yoga		354	14.9%		
Meditation		579	24.3%		
Spending time with a friend		1560	65.5%		
Vacation		779	32.7%		
Well-being Behaviors Total Score	2383			1.9	1.2
Well-Being Items	2383				
0 Well-being Behaviors		251	10.5%		
1 Well-being Behaviors		713	29.9%		
2 Well-being Behaviors		714	30.0%		
3 Well-being Behaviors		491	20.6%		
4 Well-being Behaviors		173	7.3%		
5 Well-being Behaviors		41	1.7%		
Resilience: Thriving Subscale Score (Q1-Q4)	2381			3.7	0.9
Resilience: Recovery Subscale Score(Q5-Q8)	2380			3.7	0.9
Resilience: Likert Scale Items					
Q1. Strengths	2378			4.1	1.1
Q2. Thriving	2365			3.4	1.2
Q3. Meaningful	2373			3.9	1.1
Q4. Looking forward	2372			3.3	1.2
Q5. Bounce Back	2375			3.5	1.2
Q6. Adapt	2373			4.0	0.9
Q7. Mood recovery	2376			3.7	1.1
Q8. Positive outlook	2376			3.6	1.1

Note. M=Mean, SD = Standard deviation

The bivariate results in Table 10 indicate that each of the five types of well-being behaviors were significantly related to emotional thriving (all $p \leq 0.0015$), with those who reported each behavior having significantly higher mean emotional thriving scores when compared to those who did not report the behavior. In contrast, three of the five well-being behaviors were significantly related to emotional recovery. Well-being behaviors associated with higher mean emotional recovery scores were exercise ($p < 0.0001$), meditation ($p = 0.0015$), and spending time with a close friend ($p = 0.0008$).

Engaging in more well-being behaviors was also significantly related to better emotional thriving and emotional recovery ($p < 0.0001$).

Table 10 *Bivariate Analysis: Relation Between Well-being Behaviors and Resilience (N=2383)*

Factors: Well-being Behavior	Resilience: Thriving Mean \pm SD	Resilience: Thriving p-value	Resilience: Recovery Mean \pm SD	Resilience: Recovery p-value
Exercise		<.0001		<.0001
No	3.6 \pm 0.9		3.6 \pm 0.9	
Yes	3.7 \pm 0.9		3.8 \pm 0.8	
Yoga		0.0011		0.1461
No	3.6 \pm 0.9		3.7 \pm 0.9	
Yes	3.8 \pm 0.8		3.8 \pm 0.8	
Meditation		<.0001		0.0015
No	3.6 \pm 0.9		3.7 \pm 0.9	
Yes	3.8 \pm 0.9		3.8 \pm 0.9	
Spending time with a close friend		<.0001		0.0008
No	3.5 \pm 0.9		3.6 \pm 0.9	
Yes	3.7 \pm 0.9		3.7 \pm 0.8	
Vacation		0.0015		0.0792
No	3.6 \pm 0.9		3.7 \pm 0.9	
Yes	3.8 \pm 0.9		3.7 \pm 0.9	
Well-being Total Score		<.0001		<.0001
0 Well-being Behaviors	3.4 \pm 1.0		3.5 \pm 0.9	
1 Well-being Behaviors	3.6 \pm 0.9		3.7 \pm 0.9	
2 Well-Being Behaviors	3.7 \pm 0.9		3.6 \pm 0.8	
3 Well-Being Behaviors	3.9 \pm 0.8		3.8 \pm 0.8	
4 Well-Being Behaviors	3.8 \pm 0.9		3.9 \pm 0.8	
5 Well-Being Behaviors	4.2 \pm 0.7		4.0 \pm 0.8	

Note. SD=Standard Deviation; higher resilience scores represent greater resilience. P-values from bivariate analysis using a General Linear Model approach

4.4.3 Well-being Behaviors and Resilience: Multivariable Models

The final parsimonious models are presented in Tables 11 and 12. These final models that included all well-being behaviors controlling for significant covariates indicated that each type of well-being behavior was significantly related to greater emotional thriving (all $p \leq .0273$). Only two of the five behaviors (exercise and spent time with a close friend) were significantly associated with greater emotional recovery (both

$p \leq .0034$). Additionally, reported engagement in more well-being behaviors continued to be associated with better emotional thriving and emotional recovery ($p < .0001$). For the statistically significant results, the partial eta squared values addressing clinical relevance indicated small effect sizes (η^2 of 0.0018 to 0.0262).

The following sociodemographic and professional characteristics were significant covariates at the 0.05 level in one or more final models. Sex was a significant covariate in all final models, with females having significantly lower mean emotional thriving and emotional recovery scores than males. On average, White HCWs had both a significantly lower mean emotional recovery score than Black/African Americans and significantly lower mean emotional thriving and emotional recovery scores than other minorities (Asian, Native Hawaiian or Pacific Islander, American Indian, and Alaska Native). Black/ African Americans and other minorities did not differ on the resilience measures. HCW role was significantly associated with emotional recovery where physicians had lower mean emotional recovery scores than nurses and those in the other category that comprised students, other managers, environmental support, administrative support, and other.

HCWs with more years of professional experience tended to have significantly higher mean emotional thriving and emotional recovery scores compared to those with less experience. Specifically, those with 11–20 and 21 or more years of professional

experience had significantly higher emotional thriving scores than those with 5–10 years' experience. HCWs with 21 or more years of experience had significantly greater emotional recovery scores than those with less experience. Those with 5–10 and 11–20 years' experience had significantly greater emotional recovery scores than those with four or fewer years' experience. Results for years in current position differed from overall experience in that those with less than one year in their current position had significantly higher mean emotional thriving and emotional recovery scores than those with increasingly more years in current position. One exception was noted where those with the most time in their current position (21 or more years) did not differ significantly in emotional thriving levels from those with less than one year in their current position. Those with most time in their current position (21 or more years) also had significantly higher emotional thriving score than those with 5–10 years of experience. Finally, the covariate results showed that inpatient respondents did not differ significantly from those working in an outpatient setting for emotional thriving and emotional recovery.

Table 11 *Individual Well-being Behaviors and Resilience: Final Analysis of Covariance Results*

Resilience Outcome	Explanatory Variables	F (df1, df2)	p	Partial η^2	Partial η^2 95% CI
Thriving (N=2287)	Exercise	7.82 (1, 2268)	0.0052	0.0034	0.0003, 0.0098
	Yoga	4.88(1, 2268)	0.0273	0.0021	0.0000, 0.0075
	Meditation	9.55(1, 2268)	0.0020	0.0042	0.0006, 0.0110
	Friend	15.14(1, 2268)	0.0001	0.0066	0.0016, 0.0148
	Vacation	6.99(1, 2268)	0.0083	0.0031	0.0002, 0.0092
	Sex	4.86(1, 2268)	0.0276	0.0021	0.0000, 0.0075
	Race	3.82(2, 2268)	0.0222	0.0034	0.0000, 0.0091
	Years Professional Experience	2.88(4, 2268)	0.0217	0.0050	0.0001, 0.0108
	Years in Current Position	3.41(4, 2268)	0.0087	0.0060	0.0004, 0.0122
	Clinical Setting	6.38(2, 2268)	0.0017	0.0056	0.0008, 0.0127
Recovery (N=2284)	Exercise	20.34(1, 2261)	<.0001	0.0089	0.0028, 0.0180
	Yoga	1.01(1, 2261)	0.3147	0.0004	0.0000, 0.0038
	Meditation	2.86(1, 2261)	0.0911	0.0013	0.0000, 0.0058
	Friend	8.58(1, 2261)	0.0034	0.0038	0.0004, 0.0104
	Vacation	1.87(1, 2261)	0.1713	0.0008	0.0000, 0.0048
	Sex	4.14(1, 2261)	0.0421	0.0018	0.0000, 0.0069
	Race	13.80(2, 2261)	<.0001	0.0121	0.0044, 0.0218
	Healthcare Worker Role	3.61(4, 2261)	0.0062	0.0063	0.0006, 0.0127
	Years Professional Experience	9.59(4, 2261)	<.0001	0.0167	0.0067, 0.0269
	Years in Current Position	4.28(4, 2261)	0.0019	0.0075	0.0011, 0.0145
Clinical Setting	3.72(2, 2261)	0.0243	0.0033	0.0000, 0.0090	

Note. η^2 =eta squared effect size: 0.01=small, 0.06=medium, 0.14=large; CI = Confidence Interval; Type III Sum of Squares reported.

Table 12 *Total Well-being Behaviors and Resilience: Final Analysis of Covariance Results*

Resilience Outcome	Explanatory Variables	F (df1, df2)	p	Partial η^2	Partial η^2 95% CI
Thriving (N=2287)	Well-being total score	61.03(1, 2272)	<.0001	0.0262	0.0147, 0.0402
	Sex	4.60(1, 2272)	0.0320	0.0020	0.0000, 0.0073
	Race	3.91(2, 2272)	0.0202	0.0034	0.0001, 0.0092
	Years of Professional Experience	2.80(4, 2272)	0.0248	0.0049	0.0000, 0.0105
	Years in Current Position	3.52(4, 2272)	0.0071	0.0062	0.0005, 0.0125
	Clinical Setting	6.44(2, 2272)	0.0016	0.0056	0.0009, 0.0128
Recovery (N=2284)	Well-being total score	40.16(1, 2265)	<.0001	0.0174	0.0083, 0.0293
	Sex	5.00(1, 2265)	0.0254	0.0022	0.0000, 0.0077
	Race	13.99(2, 2265)	<.0001	0.0122	0.0045, 0.0220
	Healthcare Worker Role	3.58(4, 2265)	0.0065	0.0063	0.0005, 0.0127
	Years of Professional Experience	9.42(4, 2265)	<.0001	0.0164	0.0065, 0.0265
	Years in Current Position	4.16(4, 2265)	0.0023	0.0073	0.0010, 0.0142
	Clinical Setting	3.63(2, 2265)	0.0268	0.0032	0.0000, 0.0088

Note. η^2 =eta squared effect size: 0.01=small, 0.06=medium, 0.14=large; CI = Confidence Interval; Type III Sum of Squares reported.

4.5 Discussion

Our findings showed all five well-being behaviors (exercise, yoga, meditation, time with a close friend, and vacation) were common and that more types of behaviors reported by HCWs were consistently associated with better emotional resilience. All well-being behaviors were significantly associated with emotional thriving, whereas only exercise and time with a close friend were related to emotional recovery. HCW role was significantly associated with emotional recovery where physicians had lower mean emotional recovery scores than nurses. In addition, HCW sex, race, and experience were associated with resilience.

Our findings were similar to other studies that assessed well-being behaviors. For instance, Shanafelt et al. (2012), reported that exercise, time with friends or family, and vacations were related with either lower burnout or higher quality of life among U.S. surgeons. Other studies have similarly reported on the benefits of exercise (Guo et al., 2018) and close relationships (Rippstein-Leuenberger et al., 2017) among HCWs as it relates to improving resilience or burnout. As exercise and time with a close friend are well-being behaviors that usually occur at an individual's own volition, these findings suggest that there might be particular strategies HCWs can engage in to promote their own emotional recovery. Alternatively, focusing on any of the five well-being behaviors investigated in this study, and optimally more than one, could also be a way to enhance

emotional thriving. In contrast to other literature that suggests meditation was not beneficial as a well-being behavior (Lebensohn et al., 2013; Shanafelt et al., 2012), this study found that those who reported engaging in meditation over the last month were significantly related to higher emotional thriving. The difference in findings is possibly due to measuring the use of meditation among one type of HCW rather than across a variety of HCW disciplines (Lebensohn et al., 2013; Shanafelt et al., 2012). Additionally, and similar to our study, the frequency and duration of a meditation practice was not measured (Lebensohn et al., 2013). Additional research is needed to determine how the frequency and duration of meditation practice relate to emotional thriving and emotional recovery.

We recognize that burnout and resilience are not simply opposites of one another given previous findings that those with burnout can also exhibit high resilience (West et al., 2020). However, the research on burnout and associated characteristics among HCWs is robust and worth examining as we assess our findings related to resilience. Similar to the burnout literature that shows HCW sex is related to burnout, with women reporting higher burnout (Shanafelt et al., 2016, 2019), the present study showed HCW sex is related to resilience. We found that women reported significantly lower emotional thriving and emotional recovery scores than men. Our findings also contribute to the literature by showing HCW race is related to resilience with Black HCWs reporting

higher emotional recovery scores compared to White HCWs. These findings are similar to the burnout literature that shows Black HCWs have lower burnout (Dyrbye et al., 2007; Maslach, 1982/2003). Cohesion among family and friends in the black community and the adversities and challenges minorities experience compared to their White counterparts may partially explain this finding (Dyrbye et al., 2007). However, the relationship between the quality and quantity of time spent with friends or family and their relationship with resilience are unclear.

Research demonstrates that a higher percentage of physicians report burnout (44%) (Shanafelt et al., 2019) than do nurses (35%) (Dyrbye et al., 2019). When comparing physicians and nurses in the same sample, the present study showed physicians reported significantly lower emotional recovery scores than nurses. This finding warrants further investigation to ascertain what factors are driving physicians' lower reported emotional recovery scores in comparison to nursing colleagues. Future research should also assess the implications for nurses who work with physicians who have lower emotional recovery. Evidence has shown that HCWs reporting personal burnout is related to also reporting their colleagues as burned out (Schwartz et al., 2019; Sexton et al., 2018) thus calling to question the level of contagion that exists with burnout among HCWs working in an interprofessional environment. (Schwartz et al., 2019). Understanding how lower and alternatively high levels of resilience may similarly

translate across nurses and other members of the interprofessional team in the HCW environment is needed.

Similar to the burnout literature where physicians had higher burnout scores in their middle career years (Dyrbye et al., 2013), HCWs in our sample reported higher emotional thriving scores later in their career (11–20 years and 21 or more years of professional experience) compared to the 5–10-year range. However, having <1 year in current position was associated with higher emotional thriving scores than all other years with exception to those with 21 or more years and higher emotional recovery scores than all other years. This unique finding suggests that HCWs enter their position with a full tank of emotional thriving and emotional recovery and within one-year scores begin to significantly drop. Thus, it is not surprising that a report on nurse retention and staffing found nearly half of nurses who left their position in 2019 had less than two years of experience (Nursing Solutions, Inc., 2020). Similarly, a little more than half of all health care employees with less than two years' experience reported leaving their position (Nursing Solutions, Inc., 2020).

Our effect sizes ranging from η^2 of 0.0018 to 0.0262 can be referenced with Cohen's standard of small (0.01), medium (0.06), and large (0.14) effect sizes (Cohen, 1969, as cited in Richardson, 2011). Although statistically significant relationships between well-being behaviors and resilience were demonstrated, small effects were

found. These small effect sizes were viewed as clinically meaningful, particularly as we consider individual level strategies to be only one part of enhancing resilience (e.g., system level strategies being another important component to supporting resilience).

While many recent studies report on particular HCW well-being behaviors in relation to resilience or burnout (Adair et al., 2020a; Alexander et al., 2015; Gauthier et al., 2015; Goodman & Schorling, 2012; Guo et al., 2018; Mealer et al., 2014; Muir & Keim-Malpass, 2020; Oskrochi et al., 2016; Shanafelt et al., 2005, 2012; Thompson et al., 2016; van der Riet et al., 2018; Wang et al., 2018; West et al., 2016; Yang et al., 2018), limited research has been conducted on the association between the total number of well-being behaviors and resilience among HCWs. This study contributes to the literature by providing evidence that engaging in more well-being behaviors is associated with increased emotional thriving and emotional recovery, which are domains of resilience. Given that resilience is considered to be something that all have access to and can be enhanced (APA, 2020), this new knowledge could be used to inform development of interventions designed to increase HCW resilience as a strategy to alleviate burnout. Future research could assess the effectiveness of HCWs enhancing their current well-being practices, rather than adding new unfamiliar practices (Rehder et al., 2021). For instance, in HCWs who already engage in exercise, meditation, or spending time with friends, studies could assess the effects on increasing time or intensity spent on existing

well-being practices as it relates to resilience. Given the concept of job demands, including high workloads among HCWs (NASEM, 2019), it may be more prudent to strengthen existing practices rather than adding new practices to an already demanding workload, work hours, particularly for nurses working 12-hour shifts, and in the setting of already strained health care organization budgets. Interventions of this nature are especially needed nationwide due to reported high levels of depression, anxiety, and distress among HCWs during the COVID-19 response (Lai et al., 2020). The NAM, leading organization for the Action Collaborative on Clinician Well-being and Resilience, describes HCWs current experience with already high rates of burnout rate as “a surge of physical and emotional harm that amounts to a parallel pandemic” (Dzau et al., 2020, p. 1). Importantly, leaders of the NAM collaborative recommend that health care organizations infuse resources into existing well-being programs as an immediate top priority (Dzau et al., 2020). Existing programs that focus on these well-being behaviors could get more value through increased emotional thriving and emotional recovery.

Given these findings, health care organizations may wish to consider implementing strategies to promote particular types of well-being behaviors in the work environment with the goal of improving resilience. More specifically, organizations could integrate “bite-sized” well-being practices, ideally more than one, into existing

work tasks to encourage HCWs to engage in well-being behaviors in a way that feasibly fits with their busy work life (Adair et al., 2020a). For instance, writing a gratitude letter (Adair et al., 2020b), teaching HCWs to engage in moments of mindfulness before the start of a meeting or huddle, walking meetings, and competitions designed to increase physical activity at work are a few ways to encourage well-being activities while acknowledging that busy HCWs do not need “one more thing” added on top of their busy work lives. Additionally, national organizations such as the American Nurses Association have new well-being initiatives with online tools supporting social connection and goal setting for well-being activities such as exercise and mindfulness (American Nurses Association Enterprise, 2020). Similarly, the NAM provides practical strategies to support well-being behaviors that relate to our findings such as taking breaks, when feasible, to exercise and engage in breathing practices that are akin to meditation and connecting with others for social support (NAM, 2020). Some units have established a social committee, driven by the HCWs themselves, to plan social events both inside and outside of the workplace. As findings showed resilience varied by HCW sex, race, role, and experience, interventions may need to be tailored to address the unique characteristics of participants. Finally, educators could incorporate information on engaging in well-being behaviors in prelicensure HCW curriculums and in continuing education in clinical settings (Chappel et al., 2018). Integrating ways to

promote resilience is important as HCWs navigate the stress of caring for patients, particularly during the Covid-19 pandemic.

Strengths of this study include a large sample size, robust set of covariates, use of a multivariable approach in assessing resilience, and a brief resilience metric that is responsive to interventions. Another strength of this study was the inclusion of different shift lengths; however, most of our sample reported working 8 hours followed by 12 hours. While longer shifts (12 hours or greater) have been linked to burnout in hospital nurses (Dall'Ora et al., 2015), less is known about various shift lengths and work settings with resilience. Relatedly, the sample included all HCWs with resilience data who completed the baseline survey which allowed us to look broadly across HCWs, including those who reported working in the inpatient setting, outpatient setting, and those that selected not-applicable. We felt that broadly looking across all HCWs, inclusive of various work hours and work settings was an important first step in assessing well-being behaviors and resilience. However, this study is not without limitations. First, the correlational design limits our ability to make causal inferences between well-being behaviors and resilience. Nevertheless, our findings provide foundational knowledge on the relationship between well-being behaviors and resilience. We also assessed well-being behaviors based on reports of whether the HCW had engaged in them over the last month. We have no way of knowing the frequency

and duration of engaging in these behaviors, as research has demonstrated a dosing effect in terms of outcomes being enhanced with more meditation practice as an example (Goleman & Davidson, 2017). Understanding the amount of time engaged in well-being behaviors may also elucidate the small effect sizes in our sample. Despite this limitation, understanding the well-being behaviors that HCWs have reported in the last month was sufficient in providing foundational knowledge, conveying a significant relationship with well-being behaviors and emotional thriving and emotional recovery.

Future research should focus on refining and validating brief well-being interventions for HCWs with an assessment on effects of the intervention on resilience levels and patient outcomes. Research should explore optimal dosing of well-being behaviors, and also assess why different groups of HCWs are experiencing varying levels of resilience. This knowledge can inform institutions in modifying work environments and policies to prevent and reduce burnout in HCWs, including in vulnerable groups. Additionally, while research has demonstrated that those with high resilience have lower levels of burnout (Adair et al., 2020a; Guo et al., 2018); recent evidence has also found that physicians with top resilience scores also report burnout (West et al., 2020). It is unknown whether this relationship also occurs in nurses. Future research should assess the various ways in which resilience and burnout occur with one

another for nurses. This information will inform possible interventions designed to prevent burnout or enhance resilience.

Engaging in particular well-being behaviors and increasing the total number of behaviors is a promising strategy for increasing resilience. Given the high levels of HCW burnout (Dyrbye et al., 2019; Shanafelt et al., 2019) and current pandemic, well-being strategies to enhance resilience are important for further exploration.

Chapter 5. Conclusion

5.1 Introduction

The purpose of this dissertation was to generate evidence regarding HCW burnout and resilience. Specifically, this dissertation (1) identified stressors reported by HCWs in all aspects of their lives (Chapter 2); (2) identified subgroups of nurses based on their levels of burnout (measured by emotional exhaustion) and resilience (measured by emotional thriving and emotional recovery) (Chapter 3); and (3) identified the types and total number of well-being behaviors that are associated with increased resilience in HCWs (as measured by emotional thriving and emotional recovery) (Chapter 4). Chapters two and three aimed to describe the problem by identifying the stressors and assessing the co-occurrence of burnout and resilience. Chapter 4 took a solution-oriented approach by identifying well-being behaviors and their relationship with resilience.

5.2 Summary of Chapter 2 with Implications for Research and Practice

The primary goal of Chapter 2 was to better understand the major stressors that HCWs experience by analyzing responses to the question: What are your biggest stressors as you look back over the last few weeks? The specific aim was to analyze responses from HCWs on the open-ended question, “What are your biggest stressors as you look back over the last few weeks?” (Rink et al., 2023). The study used a qualitative descriptive design to allow for rich detailed descriptions of the data (Sandelowski, 2010). The data, included a sample of 2310 HCWS, were analyzed using a summative content

analysis that provided an avenue for HCWs' responses to be described with details of the frequency of stressors (Hsieh & Shannon, 2005).

This study provided an important perspective of HCW stressors that are outside of the commonly reported contexts of work (NASEM, 2019) or the Covid-19 pandemic (Liner et al., 2021; Munn et al., 2022; Prasad et al., 2021). Findings revealed that HCWs were experiencing stressors in the following areas: (1) work stressors (49% of the total stressors); (2) personal life stressors (32% of total stressors); and (3) stressors that intersect work and personal life (19% of total stressors) (Rink et al., 2023). The findings indicate that while work stressors were most frequently reported, other stressors inclusive of the HCWs personal life were also predominant (Rink et al., 2023). These findings underscore the notion that HCWs are whole human beings that experience and carry stressors beyond the context of their work lives each day. Future research is needed to better understand how to effectively address stressors that include and go beyond the often-focused area of work stress (Rink et al., 2023). Leaders can assess whether their employees are experiencing similar stressors, and work to address the most common stressors among their staff (Rink et al., 2023). Work-system interventions are also needed in practice environments to improve clinician well-being, since many stressors were considered to originate from the larger system-level such as workload and short-staffed clinical environments (Rink et al., 2023). More research is needed to reduce burnout and improve well-being among HCWs through work-system approaches such as identifying an appropriate workload (NASEM, 2019).

5.3 Summary of Chapter 3 with Implications for Research and Practice

The primary focus of Chapter 3 was to understand the different ways that burnout and resilience co-occur in nurses. Specific aims were to (1) identify subgroups of nurses based on their distinct profiles of burnout (emotional exhaustion) and resilience (emotional thriving and emotional recovery); and (2) determine which nurse sociodemographic, professional, and psychological characteristics were related with each profile. The study included a latent profile analysis of 683 nurses to identify subgroups of nurses based on their scores of emotional exhaustion, emotional thriving, and emotional recovery followed by bivariate statistics used to capture the related nurse characteristics with each profile.

The results of the study identified four profiles of nurses including (1) “exhausted” (14% with very high emotional exhaustion, low emotional thriving, and moderate emotional recovery), (2) “exhausted with thriving” (6% with high emotional exhaustion, moderate-high emotional thriving, and low emotional recovery), (3) “exhausted with thriving and recovery” (52% with moderate-high emotional exhaustion, emotional thriving, and emotional recovery), and (4) “thriving and recovery” (27% with low emotional exhaustion and very high emotional thriving and emotional recovery). The third profile, “exhausted with thriving and recovery” was surprising our largest profile. Current evidence points to burnout and resilience as largely on opposite ends of the same continuum (Guo et al., 2018; Rushton et al., 2015).

This finding of 52% (N=358) of the sample (N=683) suggests that burnout and resilience can co-occur together at moderately high levels.

More favorable psychological characteristics of lower depression scores, more positive emotions, more well-being behaviors and better work-life balance were more likely to occur in the profiles with higher levels of thriving and recovery (e.g., “exhausted with thriving and recovery” and “thriving and recovery” profiles). Additionally, nurses who worked in the in-patient setting were more likely to be in the “exhausted” profile while greater racial minority representation was found in the “thriving and recovery” group. These findings of favorable characteristics in the “exhausted with thriving and recovery” profile were notable as they indicate that resilience may have a protective effect despite the presence of burnout. Additional research is needed to test the effectiveness of strategies aimed to increase emotional thriving and emotional recovery and should include an assessment of their relationship with nurse sociodemographic, professional, and psychological characteristics.

These findings indicate that resilience boosting interventions in the workplace may be promising in addressing HCW well-being. One such intervention that warrants further exploration includes brief well-being exercises based on positive psychology (Sexton et al., 2022). A recent RCT of HCWs demonstrated significantly improved emotional thriving and emotional recovery that was maintained up to twelve months after engaging in an intervention which consisted of brief text-based well-being exercises over ten days (Sexton et al., 2022). The well-being exercises included reflecting on three

good things, acts of kindness, moments of awe, as well as cultivating relationships, and gratitude (Sexton et al., 2022). This intervention was simple, accessible, and demonstrated effectiveness in a large, randomized sample of HCWs (Sexton et al., 2022) and should be further tested among HCWs and health professional students. These brief simple interventions should be integrated and tested into the clinical environment. Hospital unit based projects that allow for brief time during a shift to reflect on three good things could be tested among a variety of HCWs.

5.4 Summary of Chapter 4 with Implications for Research and Practice

The purpose of chapter 4 was to understand how well-being behaviors related to resilience. Specific aims were to: (1) identify the types of well-being behaviors, (i.e., regular exercise, yoga, meditation, spent time with a close friend, and vacation) and their associations with resilience as measured by emotional thriving and emotional recovery; and (2) identify the relationship between the total number of well-being behaviors with emotional thriving and emotional recovery (Rink et al., 2021). The study included a descriptive correlational design using general linear models to examine all relationships among the 2383 HCWs in the sample (Rink et al., 2021). Bivariate analysis of variance models were used to examine each well-being behaviors and the total number of well-being behaviors respectively with emotional thriving and emotional recovery (Rink et al., 2021). Additionally, analysis of covariance was conducted to

examine these relationships while adjusting for HCW sociodemographic and professional characteristics (Rink et al., 2021).

The results from this study showed that certain well-being behaviors were related to greater resilience (Rink et al., 2021). Specifically, we found that all of the well-being behaviors were related to greater emotional thriving, while only exercise and spent time with a close friend were related to greater emotional recovery, after controlling for HCW characteristics (Rink et al., 2021). These findings help extend the body of evidence regarding the benefits of engaging in certain well-being behaviors such as exercise (Guo et al., 2018) and engaging in social connections (Rippstein-Leuenberger et al., 2017) while also adding a new understanding of the importance of engaging in more well-being behaviors as it relates resilience (Rink et al., 2021). Future research is needed to determine the optimal approaches for well-being behaviors including their frequency and duration (Rink et al., 2021) and the degree to which certain well-being behaviors may be an optimal fit for certain individuals (Lyubomirsky & Layous, 2013). These well-being behaviors could be tested in the practice arena to determine how to feasibly integrate into daily work (e.g., exercise via step contests, practicing mindfulness during staff huddles, or a social activity) (Rink et al., 2021).

5.4 Education and Policy Implications

5.4.1 Improving HCW Well-being Through Education

Early signs of stress emerge in the education setting as evidenced by increasing levels of maladaptive fatigue and decreasing ability to recover between shifts among

nursing students (Rella et al., 2008). These findings suggest that students are entering the workforce with already low psychological reserves (Rella et al., 2008). These elements of stress are a precursor to burnout (WHO, 2022) and signify a clear need for stress management education in nursing education. While important steps to support the well-being of clinicians have been initiated (NASEM, 2021; NASEM, 2019), less is being done in nursing education to help students build their stress management and resilience tools (Cochran et al., 2020) despite the American Association of Colleges of Nurses (AACN) having delineated the expected competencies of nursing graduates that specifically includes a need for “participation in activities and self-reflection that foster personal health, resilience, and well-being” (AACN, n.d.). Alternatively, medical schools and residency programs have integrated well-being into their curriculums (Dyrbye et al., 2019b). Specifically, the Accreditation Council for Graduate Medical Education requires that residency and fellowship programs include certain well-being components (ACGME, n.d.). Health professional education, and particularly nursing education, should build these skills of well-being into early curriculum.

5.4.1 Improving HCW Well-being Through Policy

Policies are needed to address the root causes of burnout which are largely work-system factors (NASEM, 2019). From an internal perspective, healthcare organizations should develop policies and procedures to routinely assess the utility of administrative requirements that are not mandated by outside organizations (NASEM, 2019). Additionally, policies should be implemented that assess and address out of balance

workloads for all types of HCWs (NASEM, 2019). Healthcare organizations should also focus internal policy making on ways to improve culture and team dynamics (NASEM, 2019). Concurrently, policies outside of the healthcare organization should be continually reviewed by regulatory agencies and legislators that assess the necessity of mandatory regulatory reporting and other administrative requirements that are overly burdensome that increase workload and decrease the amount of time HCWs have to connect with patients (NASEM, 2019). Addressing these and other work-system factors are an integral part of addressing HCW burnout (NASEM, 2019).

5.4 Strengths and Limitations

The strengths of this dissertation included a large sample size and a diverse set of covariates related to sociodemographic and psychological characteristics of HCWs. Additionally, HCWs were represented across a broad range of fields and in the inpatient and outpatient settings. This dissertation included one of the first assessments of how burnout and resilience can co-occur in nurses. However, this study is not without limitations. While the WISER database has a large, heterogenous sample with few exclusion criteria, there are limits on data availability based on what was collected in the parent study. Additionally, the database does not contain sample weights which can result in selection bias (Lavallée & Beaumont, 2015). For instance, if physicians overrepresented the overall HCW population, then the generalizability of the findings to all HCWs could be in question (Polit & Beck, 2017). An additional limitation is that the HCWs who enrolled in the WISER study may have different characteristics than those

who did not enroll (Sidani, 2012; Kaptchuk, 2001). For example, those who enrolled may have been interested in engaging in well-being tools thus introducing possible bias. Finally, this dissertation used a descriptive, correlational design that prevents inferences of causation (Polit & Beck, 2017). However, the findings provide a basis for future interventional studies.

5.4 Conclusion

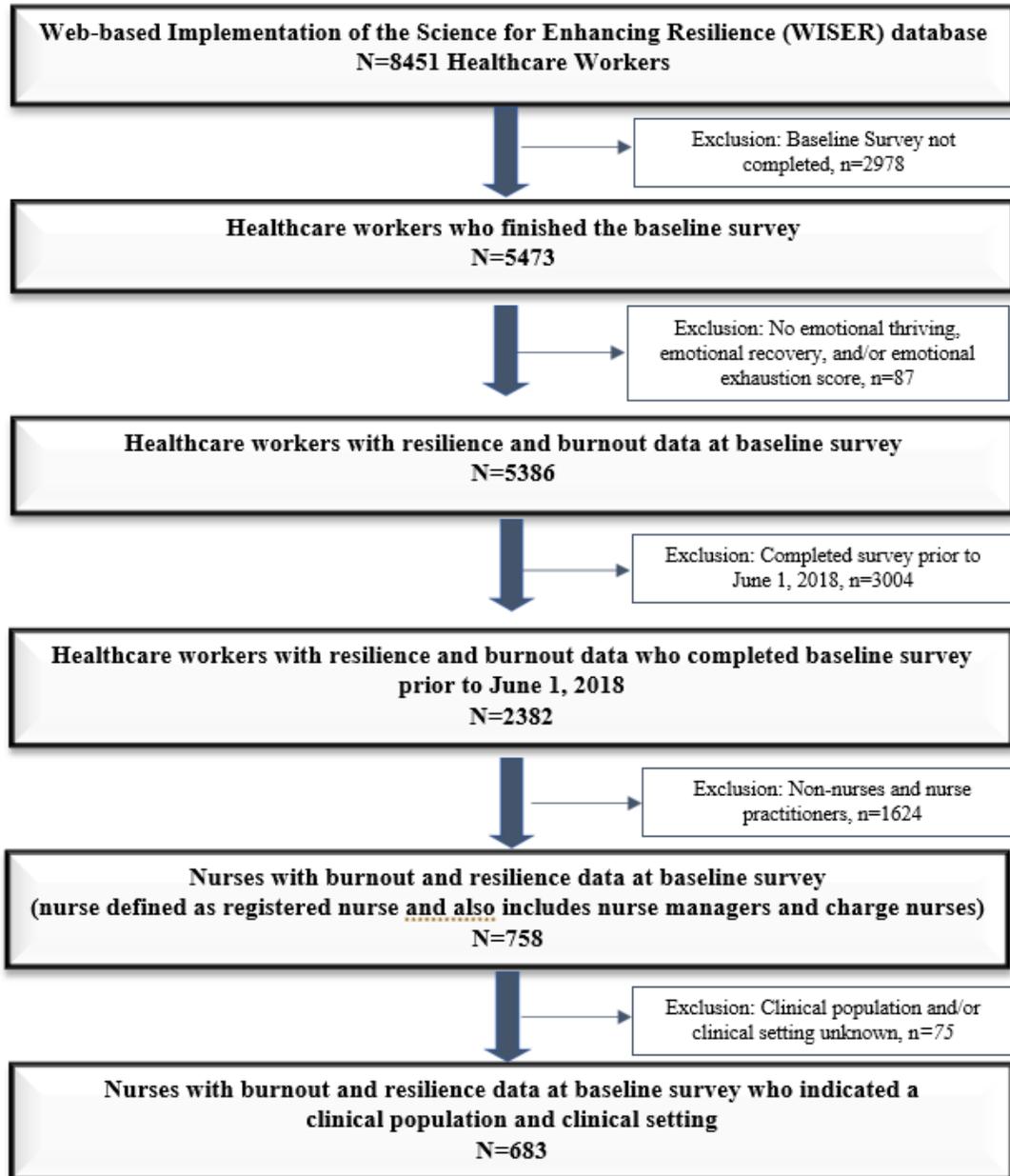
The primary aim of this dissertation was to generate evidence that can be used to improve HCW well-being. This dissertation included a comprehensive assessment of well-being by focusing on HCW burnout and resilience. The dissertation began by assessing stress, the precursor to burnout, through the identification of common stressors among HCWs. Next, we identified the ways in which nurses experience burnout and resilience and identified the characteristics of nurses with distinct profiles of burnout and resilience. Finally, we examined well-being behaviors that are associated with resilience.

Findings from this dissertation contribute to the literature by advancing knowledge on the current understanding of HCW burnout and resilience. Specifically, understanding the comprehensive extent of HCWs' stressors can guide healthcare organizations in designing further research and interventions that aim to reduce employee stress and burnout. Additionally, the identification of profiles of nurse burnout and resilience that extend beyond their traditional dichotomous relationship can inform future interventions designed to increase emotional thriving and emotional

recovery rather than an exclusive focus on lowering burnout. Finally, future research could further assess the well-being behaviors found in this dissertation, particularly those that promote exercise and spending time with friends, to enhance resilience.

Appendix A: Supplementary Materials for Chapter 3

Supplemental Figure 1. Determination of the Final Analysis Sample



Supplemental Table 1. Key Study Variables

	Construct	Survey Item	Description/Definition/Coding
Latent Profile Measures	Burnout		
	Emotional Exhaustion	<p>Emotional Exhaustion Scale:</p> <p>Please read the following items and responses carefully.</p> <p>I feel fatigued when I get up in the morning and have to face another day on the job.</p> <p>I feel burned out from my work.</p> <p>I feel frustrated by my job.</p> <p>I feel I am working too hard on my job.</p> <p>Events at work affect my life in an emotionally unhealthy way.</p>	<p>Response options and coding: 1=Disagree Strongly; 2=Disagree Slightly; 3=Neutral; 4=Agree Slightly; 5=Agree Strongly</p> <p>An overall score for each participant was generated from the respective mean score. The overall scores were then converted to a 0-100 scale, with higher scores indicating a greater level of emotional exhaustion.</p>
	Resilience		
	Emotional Thriving	<p>Emotional Thriving Scale:</p> <p>Please read the following items and responses carefully.</p> <p>I have a chance to use my strengths everyday at work.</p> <p>I feel like I am thriving at my job.</p> <p>I feel like I am making a meaningful difference at my job.</p> <p>I often have something that I am looking very forward to at my job.</p>	<p>Response options and coding: 1=Disagree Strongly; 2=Disagree Slightly; 3=Neutral; 4=Agree Slightly; 5=Agree Strongly</p> <p>An overall score for each participant was generated from the respective mean score. The overall scores were then converted to a 0-100 scale, with higher scores indicating a greater level of emotional exhaustion.</p>
	Emotional Recovery	<p>Emotional Recovery Scale:</p> <p>Please read the following items and responses carefully.</p> <p>I always bounce back quickly after difficulties.</p> <p>I can adapt to events in my life that I cannot influence.</p> <p>My mood reliably recovers after frustrations and setbacks.</p> <p>I can always regain a positive outlook despite what happens.</p>	<p>Response options and coding: 1=Disagree Strongly; 2=Disagree Slightly; 3=Neutral; 4=Agree Slightly; 5=Agree Strongly</p> <p>An overall score for each participant was generated from the respective mean score. The overall scores were then converted to a 0-100 scale, with higher scores indicating a greater level of emotional exhaustion.</p>

Socio-demographic Characteristics	Gender	Gender:	Response options and coding: 1=Yes (female); 0=No (male)
	Race	My race is (option to select one):	Response options: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White Coded as: Race collapsed into two categories: 0=Non-white; 1=White Non-white=American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander
	Ethnicity	My ethnicity is:	Response options and coding: Hispanic/Latinx: 0=No, non-Hispanic/Latinx; 1=Yes, Hispanic/Latinx
Professional Characteristics	Shift length	My typical length of shift is:	Response options: 8 hours, 10 hours, 12 hours, 24 hours, Other Coded as: 1=8 hours; 2=9-10 hours; 3=12 hours or more hours
	Years in current position	Work experience: years in current position	Response options: Less than 6 months, 6-11 months, 1-2 years, 3-4 years, 5-10 years, 11-20 years, 21 or more years Coded as: 0=0-10 years; 1=11 or more years.
	Years of overall experience	Work experience: years of professional experience	Response options: Less than 6 months, 6-11 months, 1-2 years, 3-4 years, 5-10 years, 11-20 years, 21 or more years Coded as: 0=0-10 years; 1=11 or more years.
	Clinical population	I typically work in	Response options: Adults, Peds, Both, Not applicable

			Coded as: 1=Works with adult patients; 2=Works with pediatric patients; 3=Works with both adult and pediatric patients
	Clinical setting	I typically work in	Response options: Inpatient, Outpatient, Not applicable Coded as:1=Inpatient; 2=Outpatient
Psychological Characteristics	Depression Severity	Center for Epidemiologic Studies Depression Scale (CES-D) (short form) During the past week, how often did this occur? I was bothered by things that usually don't bother me. I had trouble keeping my mind on what I was doing. I felt depressed. I felt that everything I did was an effort. I felt hopeful about the future. I felt fearful. My sleep was restless. I was happy. I felt lonely. I could not "get going."	Response options and coding: 0 = Rarely or none of the time (less than 1 day), 1=Some or a little of the time (1-2 days); 2=Occasionally or a moderate amount of time (3-4 days); 3=All of the time (5-7 days) A total score was comprised of the ten item level scores, with the total scores ranging from 0-30 and higher scores indicating greater severity of depression (Andresen et al., 1994).
	Positive Emotions	modified Differential Emotions Scale (mDES) Please think back to how you felt during the <u>past 24 hours</u> . Look back over the past day (i.e., from this time yesterday up to right now). Using the scale below, indicate the greatest degree that you've experienced each of the following feelings: What is the most amused, fun-loving, or silly you felt? What is the most awe, wonder, or amazement you felt? What is the most grateful, appreciative, or thankful you felt?	Response options and coding: 0=Not at all; 1=A little bit; 2=Moderately; 3=Quite a bit; 4=Extremely. The items were coded to transition the scale from 1-5 to a 0-4. The mean overall score for participants were derived from the ten items, with overall scores ranging from 0 to 4 and higher score indicating greater levels of positive emotions (Fredrickson et al., 2019).

	<p>What is the most hopeful, optimistic, or encouraged you felt?</p> <p>What is the most inspired, uplifted, or elevated you felt?</p> <p>What is the most interested, alert, or curious you felt?</p> <p>What is the most joyful, glad, or happy you felt?</p> <p>What is the most love, closeness, or trust you felt?</p> <p>What is the most proud, confident, or self-assured you felt?</p> <p>What is the most serene, content, or peaceful you felt?</p>	
Well-being behaviors	Over the last month, what activities related to well-being have you engaged in (mark all that apply)? – meditation, regular exercise, spending time with a close friend, vacation, yoga, other.	Coding: Each well-being behavior (regular exercise, yoga, meditation, spent time with a close friend, vacation) was coded as (0, not selected) or yes (1, checked). The well-being behaviors total score is measured as the sum of the types of well-being behaviors nurses endorsed ranging from 0-5.
Work-life Integration	<p>Work-life Integration Scale (WLI)</p> <p>During the past week, how often did this occur?</p> <p>Worked through a shift/day without any breaks</p> <p>Skipped a meal</p> <p>Ate a poorly balanced meal</p> <p>Changed personal/family plans because of work</p> <p>Had difficulty sleeping</p> <p>Slept less than 5 hours in a night</p> <p>Arrived home late from work</p> <p>Felt frustrated by technology</p>	<p>Response options and coding:</p> <p>1=Rarely or none of the time (less than 1 day)</p> <p>2=Some or a little of the time (1-2 days);</p> <p>3=Occasionally or a moderate amount of time (3-4 days); 4=All of the time (5-7 days).</p> <p>The items were reverse coded and an overall score for each participant was generated by calculating the mean score of the eight items. The overall score was then converted to a 0-100 scale, with higher scores indicating better work-life integration.</p>

Supplemental Table 2. Descriptive Statistics: Emotional Exhaustion, Emotional Thriving, and Emotional Recovery

Latent Profile Measures	M	SD	Min	Max
Emotional Exhaustion Score (Q1-Q5)	3.2	1.1	1	5
Q1. I feel fatigued when I get up in the morning and have to face another day on the job.	3.4	1.3	1	5
Q2. I feel burned out from my work.	3.3	1.4	1	5
Q3. I feel frustrated by my job.	3.3	1.3	1	5
Q4. I feel I am working too hard on my job.	3.1	1.3	1	5
Q5. Events at work affect my life in an emotionally unhealthy way.	3.1	1.3	1	5
Resilience: Thriving Subscale Score (Q6-Q9)	3.7	0.9	1	5
Q6. I have a chance to use my strengths every day at work.	4.1	1.1	1	5
Q7. I feel like I am thriving at my job.	3.5	1.2	1	5
Q8. I feel like I am making a meaningful difference at my job.	4.0	1.1	1	5
Q9. I often have something that I am looking very forward to at my job.	3.2	1.1	1	5
Resilience: Recovery Subscale Score (Q10-Q13)	3.7	0.9	1	5
Q10. I always bounce back quickly after difficulties.	3.5	1.1	1	5
Q11. I can adapt to events in my life that I cannot influence.	4.0	0.9	1	5
Q12. My mood reliably recovers after frustrations and setbacks.	3.7	1.0	1	5
Q13. I can always regain a positive outlook despite what happens.	3.6	1.1	1	5
Latent Profile Measures (Converted to a 0-100 Scale)				
Emotional Exhaustion Score (Q1-Q5)	56.2	26.4	0	100
Resilience: Thriving Subscale Score (Q6-Q9)	67.5	21.9	0	100
Resilience: Recovery Subscale Score (Q10-Q13)	67.2	21.3	0	100

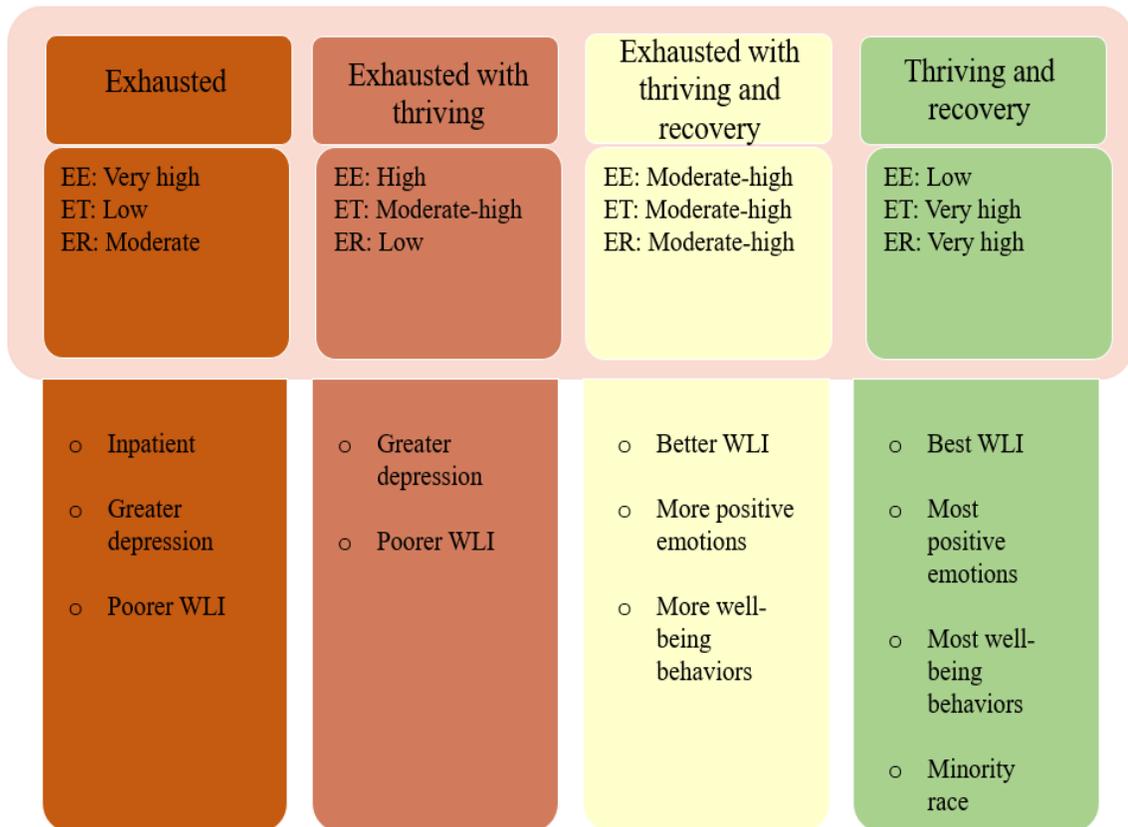
Note. M=Mean, SD=Standard deviation. Min=minimum value, Max=maximum value. Latent profile measures are the average of the respective scale items that were then converted to a 0-100 score.

Supplemental Table 3: CFA Factor Loadings: Emotional Exhaustion, Emotional Thriving, and Emotional Recovery

Q	Item	Factor 1 Burnout: Emotional Exhaustion	Factor 2 Resilience: Emotional Thriving	Factor 3 Resilience: Emotional Recovery
1	I feel fatigued when I get up in the morning and have to face another day on the job.	0.68		
2	I feel burned out from my work.	0.84		
3	I feel frustrated by my job.	0.79		
4	I feel I am working too hard on my job.	0.66		
5	Events at work affect my life in an emotionally unhealthy way.	0.69		
6	I have a chance to use my strengths every day at work.		0.63	
7	I feel like I am thriving at my job.		0.81	
8	I feel like I am making a meaningful difference at my job.		0.72	
9	I often have something that I am looking very forward to at my job.		0.65	
10	I always bounce back quickly after difficulties.			0.71
11	I can adapt to events in my life that I cannot influence.			0.60
12	My mood reliably recovers after frustrations and setbacks.			0.83
13	I can always regain a positive outlook despite what happens.			0.80

Note: CFA=Confirmatory Factor Analysis. Likert scale: 1=Disagree Strongly, 2=Disagree Slightly, 3=Neutral, 4=Agree Slightly, 5=Agree Strongly

Supplemental Figure 2. Summary: Latent Profiles and their Individual Characteristics (N = 683)



Note: Descriptions represent the notable features of the profiles and not a clinical diagnosis. EE=emotional exhaustion, ET=emotional thriving, ER=emotional recovery. WLI=work life integration

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