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Original Research

The Association between Well-being Behaviors and Resilience in Health Care Workers

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Abstract

Engaging in well-being behaviors may promote resilience, which can protect against burnout. This descriptive, correlational analysis utilized baseline data from health care workers enrolled in the Web-based Implementation of the Science for Enhancing Resilience longitudinal study ($N = 2,383$). The study aimed to describe the association of (a) types of well-being behaviors (regular exercise, yoga, meditation, spent time with a close friend, vacation) and (b) total number of well-being behaviors with resilience (emotional thriving and emotional recovery), covarying for sociodemographic and professional characteristics. General linear model findings indicated that each well-being behavior was significantly associated with greater emotional thriving, while only exercise and spending time with friends were significantly related to greater emotional recovery. Emotional thriving and emotional recovery were also significantly higher among health care workers reporting more well-being behaviors. Engaging in well-being behaviors may be one part of the solution toward increasing resilience in health care workers that warrants further investigation.

Keywords

resilience, psychological, burnout, psychological, well-being behaviors, health personnel

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

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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 suggest 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.

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.

Methods

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.

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 dataset 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.

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 $\alpha = 0.81$) 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 $\alpha = 0.82$) 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.

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.

Results

Sample Characteristics

Table 1 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%).

Well-being Behaviors and Resilience

Table 2 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

Table 1. Sample Characteristics ($N = 2,383$).

Characteristic	*n* (%)
Sex	
Female	1,936 (82.3%)
Male	417 (17.7%)
Race	
White	2,056 (87.0%)
Black/African American	111 (4.7%)
Other minorities	195 (8.3%)
Ethnicity	
Hispanic/Latinx	122 (5.2%)
Non-Hispanic/Non-Latinx	2,233 (94.8%)
Health care worker role	
Nurse	759 (31.9%)
Physician	498 (20.9%)
Physician assistant or nurse practitioner	107 (4.5%)
Other health care 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	1,264 (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%)

Note. Race: other minorities = Asian, Native Hawaiian or Pacific Islander, American Indian or Alaska Native; heath care worker role: other health care 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"

Table 2. Well-being Behaviors and Resilience: Descriptive Statistics ($N = 2,383$).

Characteristic	*N*	*n*	%	*M*	*SD*
Well-being behaviors	2,383				
Exercise		1,239	52.0%		
Yoga		354	14.9%		
Meditation		579	24.3%		
Spending time with a friend		1,560	65.5%		
Vacation		779	32.7%		
Well-being behaviors total score	2,383			1.9	1.2
Well-being items	2,383				
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)	2,381			3.7	0.9
Resilience: Recovery Subscale score(Q5–Q8)	2,380			3.7	0.9
Resilience: Likert Scale items					
Q1. Strengths	2,378			4.1	1.1
Q2. Thriving	2,365			3.4	1.2
Q3. Meaningful	2,373			3.9	1.1
Q4. Looking forward	2,372			3.3	1.2
Q5. Bounce back	2,375			3.5	1.2
Q6. Adapt	2,373			4.0	0.9
Q7. Mood recovery	2,376			3.7	1.1
Q8. Positive outlook	2,376			3.6	1.1

Note. *M* = mean, *SD* = standard deviation.

activities such as "counseling," "alone time," and "getting a massage" or hobbies such as "gardening," "fishing," and "quilting" were provided.

The bivariate results in Table 3 indicate that each of the five types of well-being behaviors were significantly related to emotional thriving (all $p \leq .0015$), 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 ($p < .0001$), meditation ($p = .0015$), and spending time with a close friend ($p = .0008$). Engaging in more well-being behaviors was also significantly related to better emotional thriving and emotional recovery ($p < .0001$).

Well-being Behaviors and Resilience: Multivariable Models

The final parsimonious models are presented in Tables 4 and 5. 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 3. Bivariate Analysis: Relation between Well-being Behaviors and Resilience ($N = 2,383$).

Factors: Well-being Behavior	Resilience: Thriving Mean ± *SD*	Resilience: Thriving *p* Value	Resilience: Recovery Mean ± *SD*	Resilience: Recovery *p* Value
Exercise		<.0001		<.0001
No	3.6 ± 0.9		3.6 ± 0.9	
Yes	3.7 ± 0.9		3.8 ± 0.8	
Yoga		.0011		.1461
No	3.6 ± 0.9		3.7 ± 0.9	
Yes	3.8 ± 0.8		3.8 ± 0.8	
Meditation		<.0001		.0015
No	3.6 ± 0.9		3.7 ± 0.9	
Yes	3.8 ± 0.9		3.8 ± 0.9	
Spending time with a close friend		<.0001		.0008
No	3.5 ± 0.9		3.6 ± 0.9	
Yes	3.7 ± 0.9		3.7 ± 0.8	
Vacation		.0015		.0792
No	3.6 ± 0.9		3.7 ± 0.9	
Yes	3.8 ± 0.9		3.7 ± 0.9	
Well-being total score		<.0001		<.0001
0 Well-being behaviors	3.4 ± 1.0		3.5 ± 0.9	
1 Well-being behaviors	3.6 ± 0.9		3.7 ± 0.9	
2 Well-being behaviors	3.7 ± 0.9		3.6 ± 0.8	
3 Well-being behaviors	3.9 ± 0.8		3.8 ± 0.8	
4 Well-being behaviors	3.8 ± 0.9		3.9 ± 0.8	
5 Well-being behaviors	4.2 ± 0.7		4.0 ± 0.8	

Note. SD = standard deviation; higher resilience scores represent greater resilience. *P* values from bivariate analysis using a general linear model approach.

Table 4. 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 ($N = 2,287$)	Exercise	$7.82_{(1, 2268)}$	.0052	0.0034	0.0003, 0.0098
	Yoga	$4.88_{(1, 2268)}$	.0273	0.0021	0.0000, 0.0075
	Meditation	$9.55_{(1, 2268)}$	.0020	0.0042	0.0006, 0.0110
	Friend	$15.14_{(1, 2268)}$	.0001	0.0066	0.0016, 0.0148
	Vacation	$6.99_{(1, 2268)}$	.0083	0.0031	0.0002, 0.0092
	Sex	$4.86_{(1, 2268)}$	.0276	0.0021	0.0000, 0.0075
	Race	$3.82_{(2, 2268)}$	.0222	0.0034	0.0000, 0.0091
	Years professional experience	$2.88_{(4, 2268)}$	.0217	0.0050	0.0001, 0.0108
	Years in current position	$3.41_{(4, 2268)}$	.0087	0.0060	0.0004, 0.0122
	Clinical setting	$6.38_{(2, 2268)}$	.0017	0.0056	0.0008, 0.0127
Recovery ($N = 2,284$)	Exercise	$20.34_{(1, 2261)}$	<.0001	0.0089	0.0028, 0.0180
	Yoga	$1.01_{(1, 2261)}$	.3147	0.0004	0.0000, 0.0038
	Meditation	$2.86_{(1, 2261)}$	.0911	0.0013	0.0000, 0.0058
	Friend	$8.58_{(1, 2261)}$	.0034	0.0038	0.0004, 0.0104
	Vacation	$1.87_{(1, 2261)}$	.1713	0.0008	0.0000, 0.0048
	Sex	$4.14_{(1, 2261)}$	.0421	0.0018	0.0000, 0.0069
	Race	$13.80_{(2, 2261)}$	<.0001	0.0121	0.0044, 0.0218
	Health care worker role	$3.61_{(4, 2261)}$	.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	$4.28_{(4, 2261)}$	.0019	0.0075	0.0011, 0.0145
	Clinical setting	$3.72_{(2, 2261)}$	.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 5. 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* = 2,287)	Well-being total score	$61.03_{(1, 2272)}$	<.0001	0.0262	0.0147, 0.0402
	Sex	$4.60_{(1, 2272)}$	.0320	0.0020	0.0000, 0.0073
	Race	$3.91_{(2, 2272)}$	.0202	0.0034	0.0001, 0.0092
	Years of professional experience	$2.80_{(4, 2272)}$	.0248	0.0049	0.0000, 0.0105
	Years in current position	$3.52_{(4, 2272)}$	.0071	0.0062	0.0005, 0.0125
	Clinical setting	$6.44_{(2, 2272)}$	.0016	0.0056	0.0009, 0.0128
Recovery (*N* = 2,284)	Well-being total score	$40.16_{(1, 2265)}$	<.0001	0.0174	0.0083, 0.0293
	Sex	$5.00_{(1, 2265)}$	.0254	0.0022	0.0000, 0.0077
	Race	$13.99_{(2, 2265)}$	<.0001	0.0122	0.0045, 0.0220
	Health care worker role	$3.58_{(4, 2265)}$	.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	$4.16_{(4, 2265)}$	.0023	0.0073	0.0010, 0.0142
	Clinical setting	$3.63_{(2, 2265)}$	.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.

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 thriving and 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., in press). 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.

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References

Adair, K. C., Kennedy, L. A., & Sexton, J. B. (2020a). Three good tools: Positively reflecting backwards and forwards is associated with robust improvements in well-being across three distinct interventions. *The Journal of Positive Psychology*, *15*(5), 613–622. https://doi.org/10.1080/17439760.2020.1789707

Adair, K. C., Rodriguez-Homs, L. G., Masoud, S., Mosca, P. J., & Sexton, J. B. (2020b). Gratitude at work: Prospective cohort study of a web-based, single-exposure well-being intervention for health care workers. *Journal of Medical Internet Research*, *22*(5), e15562. https://doi.org/10.2196/15562

Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J., & Silber, J. H. (2002). Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA*, *288*(16), 1987–1993. https://doi.org/10.1001/jama.288.16.1987

Alexander, G. K., Rollins, K., Walker, D., Wong, L., & Pennings, J. (2015). Yoga for self-care and burnout prevention among nurses. *Workplace Health & Safety*, *63*(10), 462–470. https://doi.org/10.1177/2165079915596102

American Nurses Association Enterprise. (2020). *Free tools to support the mental health and resilience of all nurses*. Retrieved June 19, 2020, from https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/what-you-need-to-know/the-well-being-initiative/

American Psychological Association. (2020). *Building your resilience*. Retrieved May 6, 2020, from https://www.apa.org/topics/resilience

Balme, E., Gerada, C., & Page, L. (2015). Doctors need to be supported, not trained in resilience. *British Medical Journal*, *351*, h4709. https://doi.org/10.1136/bmj.h4709

Chappel, K., Holmboe, E., & Wall, J. R. (2018). The role of health care profession accreditors in promoting health and well-being across the learning continuum. *National Academy of Medicine*. https://doi.org/10.31478/201811a

Cimiotti, J. P., Aiken, L. H., Sloane, D. M., & Wu, E. S. (2012). Nurse staffing, burnout, and health care-associated infection. *American Journal of Infection Control*, *40*(6), 486–490. https://doi.org/10.1016/j.ajic.2012.02.029

Cleary, M., Kornhaber, R., Thapa, D. K., West, S., & Visentin, D. (2018). The effectiveness of interventions to improve resilience among health professionals: A systematic review. *Nurse Education Today*, *71*, 247–263. https://doi.org/10.1016/j.nedt.2018.10.002

Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and Anxiety*, *18*(2), 76–82. https://doi.org/10.1002/da.10113

Dall'Ora, C., Griffiths, P., Ball, J., Simon, M., & Aiken, L. H. (2015). Association of 12 h shifts and nurses' job satisfaction, burnout and intention to leave: Findings from a cross-sectional study of 12 European countries. *BMJ Open*, *5*(9), e008331. https://doi.org/10.1136/bmjopen-2015-008331

Dyrbye, L. N., Shanafelt, T. D., Johnson, P. O., Johnson, L. A., Satele, D., & West, C. P. (2019). A cross-sectional study exploring the relationship between burnout, absenteeism, and job performance among American nurses. *BMC Nursing*, *18*(1), 1–8. https://doi.org/10.1186/s12912-019-0382-7

Dyrbye, L. N., Shanafelt, T. D., Sinsky, C. A., Cipriano, P. F., Bhatt, J., Ommaya, A., West, C. P., & Meyers, D. (2017). Burnout among health care professionals: A call to explore and address this underrecognized threat to safe, high-quality care. *NAM Perspectives*. Discussion Paper, National Academy of Medicine. https://doi.org/10.31478/201707b

Dyrbye, L. N., Thomas, M. R., Eacker, A., Harper, W., Massie, F. S., Jr., Power, D. V., Huschka, M., Novotny, P. J., Sloan, J. A., & Shanafelt, T. D. (2007). Race, ethnicity, and medical student well-being in the United States. *Archives of Internal Medicine*, *167*(19), 2103–2109. https://doi.org/10.1001/archinte.167.19.2103

Dyrbye, L. N., Varkey, P., Boone, S. L., Satele, D. V., Sloan, J. A., & Shanafelt, T. D. (2013). Physician satisfaction and burnout at different career stages. *Mayo Clinic Proceedings*, *88*(12), 1358–1367. https://doi.org/10.1016/j.mayocp.2013.07.016

Dzau, V. J., Kirch, D., & Nasca, T. (2020). Preventing a parallel pandemic—A national strategy to protect clinicians' well-being. *The New England Journal of Medicine*, *383*(6), 513–515. https://doi.org/10.1056/NEJMp2011027

Gauthier, T., Meyer, R. M., Grefe, D., & Gold, J. I. (2015). An on-the-job mindfulness-based intervention for pediatric ICU nurses: A pilot. *Journal of Pediatric Nursing*, *30*(2), 402–409. https://doi.org/10.1016/j.pedn.2014.10.005

Goodman, M. J., & Schorling, J. B. (2012). A mindfulness course decreases burnout and improves well-being among healthcare providers. *International Journal of Psychiatry in Medicine*, *43*(2), 119–128. https://doi.org/10.2190/PM.43.2.b

Goleman, D., & Davidson, R. J. (2017). *Altered traits: Science reveals how meditation changes your mind, brain, and body*. Avery.

Guo, Y. F., Luo, Y. H., Lam, L., Cross, W., Plummer, V., & Zhang, J. P. (2018). Burnout and its association with resilience in nurses: A cross-sectional study. *Journal of Clinical Nursing*, *27*(1–2), 441–449. https://doi.org/10.1111/jocn.13952

Jackson, D., Firtko, A., & Edenborough, M. (2007). Personal resilience as a strategy for surviving and thriving in the face of workplace adversity: A literature review. *Journal of Advanced Nursing*, *60*(1), 1–9. https://doi.org/10.1111/j.1365-2648.2007.04412.x

Joyce, S., Shand, F., Tighe, J., Laurent, S. J., Bryant, R. A., & Harvey, S. B. (2018). Road to resilience: A systematic review and meta-analysis of resilience training programmes and interventions. *BMJ Open*, *8*(6), e017858. https://doi.org/10.1136/bmjopen-2017-017858

Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Tan, H., Kang, L., Yao, L., Huang, M., Wang, H., Wang, G., Liu, Z., & Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to Coronavirus Disease 2019. *JAMA Network Open*, *3*(3), e203976. https://doi.org/10.1001/jamanetworkopen.2020.3976

Lebensohn, P., Dodds, S., Benn, R., Brooks, A. J., Birch, M., Cook, P., Schneider, C., Sroka, S., Waxman, D., & Maizes, V. (2013). Resident wellness behaviors: Relationship to stress, depression, and burnout. *Family Medicine*, *45*(8), 541–549.

Maslach, C. (2003). *Burnout, the cost of caring*. Malor Books. (Original work published 1982).

Matheson, C., Robertson, H. D., Elliott, A. M., Iversen, L., & Murchie, P. (2016). Resilience of primary healthcare professionals working in challenging environments: A focus group study. *British Journal of General Practice*, *66*(648), e507–e515. https://doi.org/10.3399/bjgp16X685285

McHugh, M. D., Kutney-Lee, A., Cimiotti, J. P., Sloane, D. M., & Aiken, L. H. (2011). Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care. *Health Affairs*, *30*(2), 202–210. https://doi.org/10.1377/hlthaff.2010.0100

Mealer, M., Conrad, D., Evans, J., Jooste, K., Solyntjes, J., Rothbaum, B., & Moss, M. (2014). Feasibility and acceptability of a resilience training program for intensive care unit nurses. *American Journal of Critical Care*, *23*(6), e97–e105. https://doi.org/10.4037/ajcc2014747

Melnyk, B. M., Orsolini, L., Tan, A., Arslanian-Engoren, C., Melkus, G. D., Dunbar-Jacob, J., Rice, V. H., Millan, A., Dunbar, S. B., Braun, L. T., Wilbur, J., Chyun, D. A., Gawlik, K., & Lewis, L. M. (2018). A national study links nurses' physical and mental health to medical errors and perceived worksite wellness. *Journal of Occupational and Environmental Medicine*, *60*(2), 126–131. https://doi.org/10.1097/JOM.0000000000001198

Muir, K. J., & Keim-Malpass, J. (2020). The emergency resiliency initiative: A pilot mindfulness intervention program.

Journal of Holistic Nursing, *38*(2), 205–220. https://doi.org/10.1177/0898010119874971

National Academy of Medicine. (2020). *Strategies to support the health and well-being of clinicians during the COVID-19 outbreak*. Retrieved June 19, 2020, from https://nam.edu/initiatives/clinician-resilience-and-well-being/clinician-well-being-strategies-during-covid-19/

National Academies of Sciences, Engineering, and Medicine. (2019). *Taking action against clinician burnout: A systems approach to professional well-being*. The National Academies Press. https://doi.org/10.17226/25521

Nursing Solutions, Inc. (2020). *2020 NSI national health care retention & RN staffing report*. https://www.nsinursingsolutions.com/Documents/Library/NSI_National_Health_Care_Retention_Report.pdf

O'Dougherty-Wright, M., Masten, A. S., & Narayan, A. J. (2013). Resilience processes in development: Four waves of research on positive adaptation in the context of adversity. In S. Goldstein & R. B. Brooks (Eds.), *Handbook of resilience in children* (pp. 15–37). Elsevier. https://doi.org/10.1007/978-1-4614-3661-4_2

Oskrochi, Y., Maruthappu, M., Henriksson, M., Davies, A. H., & Shalhoub, J. (2016). Beyond the body: A systematic review of the nonphysical effects of a surgical career. *Surgery*, *159*(2), 650–664. https://doi.org/10.1016/j.surg.2015.08.017

Rehder, K., Adair, K. C., & Sexton, J. B. (in press). The science of healthcare worker burnout: Assessing and improving healthcare worker well-being. *Archives of Pathology & Laboratory Medicine*.

Richardson, J. T. E. (2011). Eta squared and partial eta squared as measures of effect size in educational research. *Educational Research Review*, *6*(2), 135–147. https://doi.org/10.1016/j.edurev.2010.12.001

Rippstein-Leuenberger, K., Mauthner, O., Sexton, J. B., & Schwendimann, R. (2017). A qualitative analysis of the Three Good Things intervention in HCWs. *BMJ Open*, *7*(5), e015826. https://doi.org/10.1136/bmjopen-2017-015826

Rushton, C. H., & Pappas, S. (2020). Systems to address burnout and support well-being: Implications for intensive care unit nurses. *AACN Advanced Critical Care*, *31*(2), 141–145. https://doi.org/10.4037/aacnacc2020771

SAS Institute, Inc. (2015). *SAS 9.4.2* [Computer software]. https://support.sas.com/en/software/enterprise-guide-support.html

Schwartz, S. P., Adair, K. C., Bae, J., Rehder, K. J., Shanafelt, T. D., Profit, J., & Sexton, J. B. (2019). Work-life balance behaviours cluster in work settings and relate to burnout and safety culture: A cross-sectional survey analysis. *BMJ Quality & Safety*, *28*(2), 142–150. https://doi.org/10.1136/bmjqs-2018-007933

Sexton, J. B., & Adair, K. (2019). Forty-five good things: A prospective pilot study of the Three Good Things well-being intervention in the USA for HCW emotional exhaustion, depression, work-life balance and happiness. *BMJ Open*, *9*(3), e022695. https://doi.org/10.1136/bmjopen-2018-022695

Sexton, J. B., Adair, K. C., Leonard, M. W., Frankel, T. C., Proulx, J., Watson, S. R., Magnus, B., Bogan, B., Jamal, M., Schwendimann, R., & Frankel, A. S. (2018). Providing feedback following Leadership WalkRounds is associated with better patient safety culture, higher employee engagement and lower burnout. *BMJ Quality & Safety*, *27*(4), 261–270. https://doi.org/10.1136/bmjqs-2016-006399

Shanafelt, T. D., Dyrbye, L. N., Sinsky, C., Hasan, O., Satele, D., Sloan, J., & West, C. P. (2016). Relationship between clerical burden and characteristics of the electronic environment with physician burnout and professional satisfaction. *Mayo Clinic Proceedings*, *91*(7), 836–848. https://doi.org/10.1016/j.mayocp.2016.05.007

Shanafelt, T. D., Novotny, P., Johnson, M. E., Zhao, X., Steensma, D. P., Lacy, M. Q., Rubin, J., & Sloan, J. (2005). The well-being and personal wellness promotion strategies of medical oncologists in the North Central Cancer Treatment Group. *Oncology*, *68*(1), 23–32. https://doi.org/10.1159/000084519

Shanafelt, T. D., Oreskovich, M. R., Dyrbye, L. N., Satele, D. V., Hanks, J. B., Sloan, J. A., & Balch, C. M. (2012). Avoiding burnout: The personal health habits and wellness practices of US surgeons. *Annals of Surgery*, *255*(4), 625–633. https://doi.org/10.1097/SLA.0b013e31824b2fa0

Shanafelt, T. D., West, C. P., Sinsky, C., Trockel, M., Tutty, M., Satele, D. V., Carlasare, L. E., & Dyrbye, L. N. (2019). Changes in burnout and satisfaction with work-life integration in physicians and the general US working population between 2011 and 2017. *Mayo Clinic Proceedings*, *94*(9), 1681–1694. https://doi.org/10.1016/j.mayocp.2018.10.023

Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: Assessing the ability to bounce back. *International Journal of Behavioral Medicine*, *15*(3), 194–200. https://doi.org/10.1080/10705500802222972

Szanton, S. L., & Gill, J. M. (2010). Facilitating resilience using a society-to-cells framework: A theory of nursing essentials applied to research and practice. *Advances in Nursing Science*, *33*(4), 329–343. https://doi.org/10.1097/ANS.0b013e3181fb2ea2

Templeton, K., Bernstein, C. A., Sukhera, J., Nora, L. M., Newman, C., Burstin, H., Guille, C., Lynn, L., Schwarze, M. L., Sen, S., & Busis, N. (2019). Gender-based differences in burnout: Issues faced by women physicians. *NAM Perspectives*. Discussion Paper, National Academy of Medicine. https://doi.org/10.31478/201905a

Thompson, G., McBride, R. B., Hosford, C. C., & Halaas, G. (2016). Resilience among medical students: The role of coping style and social support. *Teaching and Learning in Medicine*, *28*(2), 174–182. https://doi.org/10.1080/10401334.2016.1146611

Tugade, M. M., & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology*, *86*(2), 320–333. https://doi.org/10.1037/0022-3514.86.2.320

van der Riet, P., Levett-Jones, T., & Aquino-Russell, C. (2018). The effectiveness of mindfulness meditation for nurses and nursing students: An integrated literature review. *Nurse Education Today*, *65*, 201–211. https://doi.org/10.1016/j.nedt.2018.03.018

Wagnild, G. (2009). A review of the Resilience Scale. *Journal of Nursing Measurement*, *17*(2), 105–113. https://doi.org/10.1891/1061-3749.17.2.105

Walsh, J. (2013). Gender, the work-life interface and wellbeing: A study of hospital doctors. *Gender, Work & Organization*, *20*(4), 439–453. https://doi.org/10.1111/j.1468-0432.2012.00593.x

Wang, L., Tao, H., Bowers, B. J., Brown, R., & Zhang, Y. (2018). Influence of social support and self-efficacy on resilience of early career registered nurses. *Western Journal of Nursing Research*, *40*(5), 648–664. https://doi.org/10.1177/0193945916685712

West, C. P., Dyrbye, L. N., Erwin, P. J., & Shanafelt, T. D. (2016). Interventions to prevent and reduce physician burnout: A systematic review and meta-analysis. *Lancet*, *388*(10057), 2272–2281. https://doi.org/10.1016/s0140-6736(16)31279-x

West, C. P., Dyrbye, L. N., Sinsky, C., Trockel, M., Tutty, M., Nedelec, L., Carlasare, L. E., & Shanafelt, T. D. (2020). Resilience and burnout among physicians and the general US working population. *JAMA Network Open*, *3*(7), e209385. https://doi.org/10.1001/jamanetworkopen.2020.9385

World Health Organization. (2019). *International statistical classification of diseases and related health problems* (11th ed.). https://icd.who.int/browse11/l-m/en#/http://id.who.int/icd/entity/129180281

Yang, G., Liu, J., Liu, L., Wu, X., Ding, S., & Xie, J. (2018). Burnout and resilience among transplant nurses in 22 hospitals in China. *Transplantation Proceedings*, *50*(10), 2905–2910. https://doi.org/10.1016/j.transproceed.2018.04.033