JONA
Volume 52, Number 11, pp 598-607

THE JOURNAL OF NURSING ADMINISTRATION

Factors Associated With Burnout Among Nurses Providing Direct Patient Care During the COVID-19 Pandemic

Bevin Cohen, PhD, MPH, MS, RN
Jonathan DePierro, PhD
Chi C. Chan, PhD
Elaine Tolan, MS, FNP-BC
Richa Deshpande, MPH
Adriana Feder, MD
Jordyn H. Feingold, MD, MSCR, MAPP
Lauren Peccoralo, MD, MPH
Robert H. Pietrzak, PhD, MPH
Jonathan Ripp, MD, MPH

OBJECTIVE: This study aimed to identify factors associated with burnout in nurses and nurses' opinions regarding interventions to promote well-being during crisis conditions such as those experienced during the COVID-19 pandemic.
BACKGROUND: Burnout among nurses is prevalent under usual conditions and may increase during crises such as COVID-19.
METHODS: Researchers conducted a survey of 1103 frontline nurses in a single New York City hospital during the first (spring 2020) and second (fall 2020/winter 2021) local waves of COVID-19.
RESULTS: Burnout prevalence increased from 45% to 52% between the first and second wave. Younger age, female gender, posttraumatic stress, anxiety or depressive symptoms, history of burnout, feeling less valued by hospital leadership, less informed of responsibilities, less certain about duration of enhanced workload, and prepared by prepandemic experience were predictive of burnout in multivariable analyses.
CONCLUSIONS: Although some identified risk factors for burnout were nonmodifiable, others may be modifiable by hospital leadership.

Burnout among nurses is a perennial challenge for healthcare organizations.[1,2] Even before the COVID-19 pandemic introduced extraordinary stressors to the healthcare workforce, the prevalence of burnout among nurses in the United States was greater than 30%.[3] Perhaps not surprisingly, data from the United States and abroad suggest that burnout rose to nearly 90% at the height of the pandemic and continues to be elevated above baseline levels.[4,5] The deleterious effects of burnout are well documented in studies describing its negative impact on quality of care, patient safety, patient satisfaction, and patient outcomes,[6,7] as well as nurses' mental health and well-being.[8] In addition, burnout and its sequelae contribute to high rates of staff turnover and the labor shortages that result as nurses leave positions, direct patient care, or the profession altogether.[9] Consequently, nurse leaders and other healthcare administrators are increasingly focused on understanding the causes of burnout in nurses and interventions that may prevent or reduce it.[10]

Crises such as the COVID-19 pandemic and the inherent nature of nursing care place nurses at risk for burnout; however, individual (eg, extraversion) and organizational (eg, permanent unit assignment) factors may be protective against burnout, whereas

Author Affiliations: Associate Professor, Department of Geriatric and Palliative Medicine, and Director, Center for Nursing Research and Innovation (Dr Cohen); Assistant Professor, Department of Psychiatry, and Director, Center for Stress, Resilience and Personal Growth (Dr DePierro); Assistant Professor, Department of Psychiatry (Dr Chan); Nurse Practitioner, Vascular Surgery, The Mount Sinai Hospital (Ms Tolan); Biostatistician, Center for Biostatistics (Ms Deshpande); Associate Professor, Department of Psychiatry, and Director, Trauma and Resilience Program (Dr Feder); Psychiatry Resident, Department of Psychiatry (Dr Feingold); Associate Professor, Department of Medicine, and Senior Associate Dean of Faculty Well-being and Development (Dr Peccoralo); and Chief Wellness Officer (Dr Ripp), Icahn School of Medicine at Mount Sinai, Mount Sinai Health System, New York; and Professor of Psychiatry, Yale School of Medicine, Professor of Public Health, Department of Social and Behavioral Sciences, Yale School of Public Health, and Director, Translational Psychiatric Epidemiology Laboratory Clinical Neurosciences Division, National Center for PTSD, VA Connecticut Healthcare System, New Haven (Dr Pietrzak).
The authors declare no conflicts of interest.
Correspondence: Dr Cohen, One Gustave L. Levy Place, New York, NY 10029 (Bevin.Cohen@mountsinai.org).
DOI: 10.1097/NNA.0000000000001216

others (eg, unpredictable staffing, having children) may contribute to greater risk.[11,12] Although some factors, such as age, gender, marital status, years of experience, and mental health history, are nonmodifiable, other factors that reflect workplace conditions and culture could potentially be addressed by hospital leadership.[12,13] Moreover, interventions to prevent or mitigate burnout could achieve greater benefits by targeting nurses at the highest risk of burnout due to either modifiable or nonmodifiable factors.[14]

In this study, researchers aimed to: 1) describe the prevalence of burnout and other mental health symptoms in a cohort of nurses employed in a single New York City hospital at 2 time points during the COVID-19 pandemic; 2) identify nonmodifiable and potentially modifiable factors associated with burnout during crisis conditions such as those experienced during COVID-19; and 3) describe nurses' opinions regarding possible interventions to reduce burnout. The overarching goal of this study is to provide data to inform decisions about resource allocation and support for nurses working during prolonged crisis periods such as the COVID-19 pandemic.

Methods

Study Design, Participants, and Setting

This analysis was conducted as part of a larger study of frontline healthcare workers at The Mount Sinai Hospital, a 1134-bed tertiary/quaternary care facility in New York City.[15] Following approval from the Icahn School of Medicine at Mount Sinai Institutional Review Board, an electronic survey was administered from April 14 through May 11, 2020, to frontline healthcare workers during the first local wave of COVID-19 in spring 2020 (wave 1). Frontline staff, including 3411 nurses, were invited to participate via email and provided informed consent electronically prior to completing the survey. To encourage participation, announcements and reminders were disseminated via staff meetings and emails, and participants were eligible to receive $25 gift cards. The same staff were invited to complete a follow-up survey administered from November 19, 2020, to January 11, 2021, during the second local wave of COVID-19 in fall 2020/winter 2021 (wave 2).

Assessments

A survey instrument, described previously,[15] was developed to assess the psychological impact of the COVID-19 pandemic on frontline healthcare workers. The survey assessed demographic characteristics, physical and mental health history, workplace duties and attitudes, current mental health and burnout, and perceptions regarding proposed interventions to improve well-being during the COVID-19 pandemic (Table 1). History of burnout and symptoms of current burnout, posttraumatic stress disorder (PTSD), generalized anxiety disorder (GAD), and major depressive disorder (MDD) was assessed using validated screening instruments, which had good or excellent internal consistency in the current sample.[15] For history of burnout, nurses screened positive if they had a cumulative score greater than 3 on the 2-item Maslach Burnout Inventory.[16] For current burnout, nurses screened positive if they scored at least 3 on the single-item Mini Z.[17] For current COVID-19–related PTSD, nurses screened positive if they had a cumulative score ≥8 on the 4-item PTSD Checklist for *DSM-5* (PCL4-5).[18] For current GAD, nurses screened positive if they had a cumulative score ≥10 on the 7-item Generalized Anxiety Disorder Scale (GAD-7).[19] For current MDD, nurses screened positive if they had a cumulative score ≥10 on the 8-item Patient Health Questionnaire (PHQ-8).[20] With the exception of 5 questions about attitudes and perceptions in the workplace and history of burnout prior to the pandemic (Table 1), the same items were assessed at both time points.

Data Analysis

Nurses were included in the analysis if they reported being directly engaged in COVID-19 patient care on the wave 1 survey and provided a response to the primary dependent variable (current burnout). Survey responses were summarized using descriptive statistics. To evaluate the potential for selection bias due to loss to follow-up, nurses who completed both surveys were compared with nurses who completed only the wave 1 survey with respect to demographic characteristics, mental health status, and burnout prevalence in bivariate analyses (χ^2 test for independence or Wilcoxon rank sum test). To identify factors associated with burnout during wave 1, we examined all independent variables in bivariate analyses and then entered them into a stepwise multivariable logistic regression model. We repeated this process to identify factors associated with burnout during wave 2 using independent variable responses from wave 1 and wave 2 surveys, with the exception of 4 demographic and health history questions (including responses at wave 2 only) and 5 questions about attitudes and perceptions in the workplace (assessed at wave 1 only). We also described the frequency with which nurses endorsed proposed interventions to improve well-being during both waves. Statistical analyses were conducted using SAS 9.4 (SAS Institute, Cary, North Carolina).

Results

A total of 1103 nurses responded to the first wave survey in spring 2020. Of these, 268 (24%) responded to

Table 1. *Items and Screening Tools Included on Survey Assessing the Psychological Impacts of COVID-19*

Demographic characteristics
Age (≥35 y, <35 y)
Gender (male, female, nonbinary/third gender, other)
Relationship status (married, partnered, single, divorced, widowed)
Years in practice (continuous)
Physical and mental health history
"Not taking into account your current age, do you consider yourself to be at low, medium, or high medical risk if you become/are infected with COVID-19, given your personal medical history and current medical conditions?" (low, medium, high)
"Have you ever been diagnosed by a doctor or healthcare professional with clinical depression, an anxiety disorder, PTSD, or another mental health condition?" (yes, no)
Workplace attitudes
"I am adequately trained to perform the professional tasks required of me during this pandemic."[a] (yes, no)
"My work and activities before the coronavirus pandemic provided me with helpful training to perform my current clinical work."[a] (yes, no)
"In my current clinical setting, I am adequately informed about my clinical duties and the role I am expected to play."[a] (yes, no)
"At present, I have a good idea of how long (weeks) my current level/volume of work will last."[a] (yes, no)
"Today, based on current recommendations, do you feel you have access to enough PPE supplies on your unit (eg, N95 masks, gowns, gloves, eye protection, cleaning materials)?"[a] (yes, no)
"To what extent do you feel valued by your immediate supervisors?" (1 = not at all valued, 2 = slightly valued, 3 = moderately valued, 4 = very much valued)
"To what extent do you feel valued by hospital leadership?" (1 = not at all valued, 2 = slightly valued, 3 = moderately valued, 4 = very much valued)
"What is the current level of camaraderie/team spirit among your group of coworkers in your own clinical practice team or setting?" (low, medium, high)
"What is the current level of support from your hospital leadership? (low, medium, high)
Workplace duties
"Do the total hours worked over the past 7 days represent an increase in the number of hours you would normally work for [this hospital] per week?" (yes, no)
"Have you been redeployed to another physical location and/or type of practice/service due to COVID-19?" (yes, no)
"How different or similar are your current type(s) of professional duties/activities from your prepandemic professional duties/activities?" (very different, somewhat different, somewhat similar, very similar)
"Are you currently directly engaged in clinical activities involving diagnosing, treating, or providing clinical care to patients with suspected or confirmed COVID-19?" (yes, no)
"What are your current professional duties/activities: direct patient care?" (yes, no)
"What clinical service/unit type are you currently on ICU?" (yes, no)
"What clinical service/unit type are you currently on medicine unit?" (yes, no)
"What clinical service/unit type are you currently on emergency department?" (yes, no)
"What clinical service/unit type are you currently on outpatient clinic?" (yes, no)
"What clinical service/unit type are you currently on operating room?" (yes, no)
Two-item Maslach Burnout Inventory screening tool for history of burnout prior to COVID-19
Please answer these questions based on the situation before the onset of the COVID-19 pandemic.[a]
1. I feel burned out from my work.
2. I've become more callous toward people since I started this job.
(never = 0, a few times a year = 1, once a month or less = 2, a few times per month = 3, once a week = 4, a few times per week = 5, every day = 6)
Mini Z screening tool for current burnout
"Using this definition of 'burnout,' please choose how you're feeling now. Burnout is a long-term stress reaction characterized by depersonalization, including cynical or negative attitudes toward patients, emotional exhaustion, a feeling of decreased personal achievement and a lack of empathy for patients." (1 = I enjoy my work. I have no symptoms of burnout.; 2 = I am under stress, and don't always have as much energy as I did, but I don't feel burned out.; 3 = I am definitely burning out and have one or more symptoms of burnout.; 4 = The symptoms of burnout that I am experiencing won't go away. I think about work frustrations a lot.; 5 = I feel completely burned out. I am at the point where I may need to seek help.)
PCL4-5 screening tool for current PTSD
In the past 2 weeks, how often were you bothered by:
1. Repeated, disturbing, and unwanted memories of your experiences related to the COVID-19 pandemic
2. Avoiding external reminders of your experiences related to the COVID-19 pandemic (eg, people, places, conversations, activities, objects, or situations)
3. Having strong negative beliefs about yourself, other people, or the world (eg, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)
4. Feeling jumpy or easily startled
(0 = not at all, 1 = a little bit, 2 = moderately, 3 = quite a bit, 4 = extremely)

(continues)

Table 1. Items and Screening Tools Included on Survey Assessing the Psychological Impacts of COVID-19, Continued

PHQ-8 screening tool for current depression
Over the last 2 weeks, how often have you been bothered by the following problems?
1. Feeling down, depressed, or hopeless
2. Having little interest or pleasure in doing things
3. Trouble falling or staying asleep, or sleeping too much
4. Feeling tired or having little energy
5. Poor appetite or overeating
6. Feeling bad about yourself, or that you are a failure, or have let yourself or your family down
7. Trouble concentrating on things, such as reading the newspaper or watching television
8. Moving or speaking so slowly that other people could have noticed. Or the opposite—being so fidgety or restless that you have been
moving around a lot more than usual
(0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day)

GAD-7 screening tool for current GAD
Over the last 2 weeks, how often have you been bothered by the following problems?
1. Feeling nervous, anxious, or on edge
2. Not being able to stop or control worrying
3. Worrying too much about different things
4. Having trouble relaxing
5. Being so restless that it's hard to sit still
6. Becoming easily annoyed or irritable
7. Feeling afraid as if something awful might happen
(0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day)

[a]Assessed at first wave only.

the second wave survey in fall 2020/winter 2021. Table 2 shows bivariate analyses comparing nurses who completed both surveys and nurses who were lost to follow-up with respect to demographic characteristics, professional backgrounds, and experiences of burnout and mental health. Nurses lost to follow-up were significantly older with more years in practice and higher medical risk (all $P < 0.001$). The prevalence of nurses who screened positive for current burnout, MDD, PTSD, and GAD during the first and second wave surveys is shown in Figure 1. While MDD, PTSD, and GAD prevalence decreased between the 2 time periods, burnout prevalence increased (all $P < 0.001$). Among nurses who responded to both surveys and screened positive for burnout in wave 2 (n = 134), 78% (n = 104) had ongoing burnout (ie, screened positive for burnout at wave 1), and 28% (n = 34) had new-onset burnout (ie, screened negative for burnout at wave 1).

Table 3 presents bivariate comparisons between nurses who did and did not screen positive for current burnout during the first wave survey. With regard to demographic characteristics, having fewer years in practice, younger age, female gender, no spouse or partner, history of mental health condition, history of burnout, and current symptoms of PTSD, GAD, or MDD were associated with screening positive for burnout (all $P < 0.05$). With regard to workplace support, nurses who screened positive for burnout felt less valued by their immediate supervisor and hospital leadership, less supported by hospital leadership, less camaraderie among peers, less adequately supplied with personal protective equipment (PPE), less adequately trained, less informed about their role and clinical duties, less prepared by their previous experience, and less certain about how long their enhanced workload would last (all $P < 0.01$). With regard to workplace duties, working in the ICU, medicine unit, or outpatient clinic, having direct patient care responsibilities, and experiencing increased working hours, redeployment, or changes in duties during COVID-19 were positively associated with burnout (all $P < 0.05$).

Table 4 presents the results of multivariable regression analyses to identify factors associated with burnout during each wave. Younger age; female gender; screening positive for PTSD, GAD, or MDD; history of burnout; feeling less valued by hospital leadership; feeling less adequately informed about current responsibilities; and feeling less certain about how long the increased workload would last were retained in the model and associated with burnout during the first wave. Younger age; history of burnout; screening positive for PTSD, GAD, or MDD at wave 2; feeling less valued by hospital leadership at wave 2; and feeling that work experience prior to the pandemic were helpful for performing assigned duties were retained in the model and associated with burnout during the second wave.

Figure 2 shows the percent of nurses endorsing proposed interventions to improve well-being during

Table 2. *Wave 1 Characteristics of Nurses Who Responded to Surveys on the Psychological Impacts of COVID-19 During the First and Second Pandemic Waves*

Characteristics	Completed First and Second Wave Surveys (n = 268)	Completed First Wave Survey Only (n = 835)	*P*
Years in practice	5 (0, 42)	9 (0, 49)	<0.001
Age			<0.001
<35 y	165 (62)	384 (46)	
≥35 y	98 (37)	422 (51)	
Gender			0.15
Female	234 (87)	682 (82)	
Male	29 (11)	116 (14)	
Relationship status			0.51
Married or partnered	171 (62)	541 (64)	
Single, divorced, or widowed	91 (34)	261 (31)	
Works in general medicine unit			0.72
Yes	84 (31)	252 (30)	
No	184 (69)	583 (70)	
Works in ICU			0.45
Yes	72 (27)	205 (25)	
No	196 (73)	630 (75)	
Works in outpatient clinic			0.14
Yes	27 (10)	113 (14)	
No	241 (90)	722 (86)	
Works in emergency department			0.77
Yes	26 (10)	76 (9)	
No	242 (90)	759 (91)	
Works in operating room			0.47
Yes	12 (4)	47 (6)	
No	256 (96)	788 (94)	
Medical risk			<0.001
Low	165 (62)	369 (44)	
Medium	71 (26)	291 (35)	
High	28 (10)	146 (17)	
History of diagnosed mental health condition			0.34
Yes	38 (14)	136 (16)	
No	226 (84)	668 (80)	
History of burnout prior to COVID-19			0.33
Yes	180 (67)	530 (64)	
No	87 (33)	296 (36)	
Screened positive at wave 1 for PTSD, GAD, or MDD			0.62
Yes	130 (49)	385 (46)	
No	135 (50)	429 (51)	
Screened positive at wave 1 for burnout			0.07
Yes	134 (50)	364 (44)	
No	134 (50)	471 (56)	

Data are frequency (percent) or median (range). Differences at wave 1 between nurses who completed both surveys versus nurses who completed the first survey only were evaluated using the χ^2 test for independence or the Wilcoxon rank sum test. Frequencies do not add to column total where responses are missing.

the first and second waves. The percent of nurses endorsing each item decreased from the first wave to the second wave for all but 2 interventions: access to scrubs and supplemental PPE training.

Discussion

This study aimed to quantify the prevalence of burnout among frontline nurses at 2 time points during the COVID-19 pandemic and examine factors that may contribute to burnout in this context. The initial onset of COVID-19 brought emotional stressors to the healthcare workforce that resulted in elevated prevalence of positive screens for burnout, in addition to PTSD, GAD, and MDD.[21] Notably, we found that although the prevalence of positive screens for PTSD, GAD, and MDD attenuated as the crisis became endemic, the prevalence of burnout increased. The nature of burnout, which encompasses emotional exhaustion, depersonalization, and lack of professional efficacy,[22] aligns closely with the expressed experiences of nurses and other healthcare workers during COVID-19, namely, that the workforce faced a deluge of very sick patients with few therapeutic options in

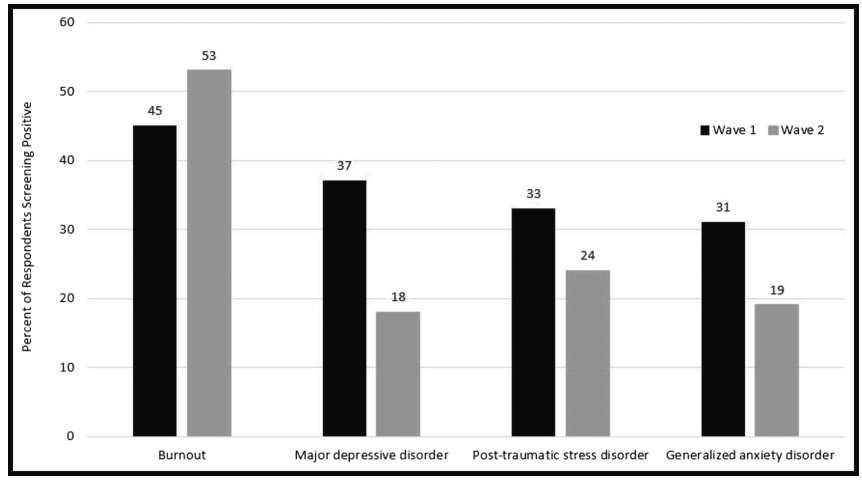

Figure 1. Percent of nurses screening positive for burnout, MDD, PTSD, and GAD during the first (n = 1103) and second (n = 268) waves of COVID-19.

an environment devoid of typical interpersonal supports due to the highly transmissible nature of this infection.[23] Unexpectedly, nurses who felt that their prepandemic clinical experience prepared them for their current duties were more likely to experience burnout during the second wave. This may be explained by prolonged and heavy exposure to critically ill patients, especially if more experienced nurses were tapped to care for the most severely affected COVID-19 patients. Given the prolonged nature of this crisis, the growing levels of burnout observed in this study may continue to increase in environments where incidence of COVID-19 remains high. Consequently, understanding the potential contributory and mitigating factors associated with burnout has become a priority in healthcare institutions struggling to support and retain staff and provide high-quality care to patients.[24,25]

Even before the pandemic introduced additional stressors and challenges, burnout was a major contributing factor to nurses' decisions to switch jobs or leave the nursing workforce entirely. For example, in a large nationally representative sample surveyed in 2018,[12] nearly 10% of nurses reported having left a job within the previous year, with greater than 30% citing burnout as a reason. An additional 17% considered leaving a job, with greater than 40% citing burnout as a reason. Work environment, which includes elements such as staffing ratios, access to resources, collegial support, and engagement by leadership, is directly correlated with nursing burnout,[26] and improving workplace conditions can significantly reduce the prevalence of burnout and nurses' intention to leave a position.[27] We asked respondents to choose from a list of preferred interventions to improve workplace conditions during COVID-19 and found that practical interventions, such as access to scrubs, PPE, and food during the workday, were endorsed at a higher level than resources such as mental healthcare and spiritual support. In addition, we found that respondents' endorsement of all but 2 of the interventions—access to scrubs and PPE training—decreased over time. The largest decreases were observed for financial support, travel options, and clear time off policies, which could reflect institutional efforts to provide crisis compensation, support private vehicle transportation, and establish and communicate evolving policies regarding paid time off, travel restrictions, and quarantine or isolation following COVID-19 exposure or positive test.

In addition to material supports for nursing staff, support from direct managers and hospital leadership has been shown to be highly protective against burnout in prepandemic settings.[28] Our findings suggest that managerial and leadership culture also plays a role in prolonged crisis settings such as COVID-19. Specifically, nurses in this study who screened positive for burnout were less likely to feel supported by hospital leadership, direct supervisors, and peers. Although it is difficult to evaluate whether the relationship between burnout and feeling valued is causal in this context, it is informative that feeling supported by hospital leadership during the first wave was protective against developing burnout during the second wave. These findings, coupled with decades of evidence derived from noncrisis settings, suggest that resilient leadership and psychologically safe organizational culture may be among the most important defenses against nurse burnout.[29]

Limitations

This study has several limitations. Selection bias could have occurred at 2 points during survey administration. First, in the initial survey, the response rate was moderate at 32%, and respondents could have differed from

Table 3. *Characteristics and Workplace Factors Associated With Burnout Among Nurses During First Wave of COVID-19*

Factor	Nurses Who Screened Positive for Burnout (n = 498)[a]	Nurses Who Did Not Screen Positive for Burnout (n = 605)[b]	*P*[c]
Demographic characteristics			
Years in practice	6 (0, 49)	8 (0, 49)	<0.001
Age			<0.001
<35 y	306 (63)	243 (42)	
≥35 y	180 (37)	340 (58)	
Gender			0.004
Female	433 (90)	483 (84)	
Male	50 (10)	95 (16)	
Relationship status			0.042
Married or partnered	309 (64)	403 (70)	
Single, divorced, or widowed	176 (36)	176 (30)	
Medical risk			0.667
Low	274 (51)	287 (49)	
Medium	158 (32)	204 (35)	
High	82 (17)	92 (16)	
History of diagnosed mental health condition			<0.001
Yes	103 (21)	71 (12)	
No	384 (79)	510 (88)	
History of burnout prior to COVID-19			<0.001
Yes	419 (85)	291 (49)	
No	74 (15)	309 (51)	
Screened positive at wave 1 for PTSD, GAD, or MDD			<0.001
Yes	335 (68)	180 (31)	
No	155 (32)	409 (69)	
Perceived value and support in the workplace			
Feeling valued by immediate supervisor			<0.001
Not at all valued	87 (17)	44 (7)	
Slightly valued	128 (26)	136 (23)	
Moderately valued	173 (35)	215 (36)	
Very much valued	108 (22)	205 (34)	
Feeling valued by hospital leadership			<0.001
Not at all valued	169 (34)	96 (16)	
Slightly valued	167 (34)	199 (33)	
Moderately valued	127 (26)	216 (36)	
Very much valued	29 (6)	84 (14)	
Perceived level of support from hospital leadership			<0.001
Low	225 (45)	152 (25)	
Medium	218 (44)	295 (49)	
High	54 (11)	156 (26)	
Perceived level of camaraderie with coworkers			<0.001
Low	71 (14)	46 (8)	
Medium	217 (44)	248 (41)	
High	210 (42)	311 (51)	
Feeling adequately supplied with PPE			<0.001
Yes	275 (55)	417 (69)	
No	222 (45)	187 (31)	
Feeling adequately trained to perform job duties			<0.001
Yes	296 (60)	460 (78)	
No	198 (40)	132 (22)	
Feeling adequately informed about role and clinical duties			<0.001
Yes	332 (67)	510 (85)	
No	161 (33)	89 (15)	
Feeling that work experience prior to the pandemic was helpful for performing assigned duties			0.008
Yes	353 (72)	469 (79)	
No	138 (28)	126 (21)	
Feeling sense of how long current workload will last			<0.001
Yes	151 (30)	275 (47)	
No	346 (70)	314 (53)	
Duties in the workplace			

(continues)

Table 3. *Characteristics and Workplace Factors Associated With Burnout Among Nurses During First Wave of COVID-19, Continued*

Factor	Nurses Who Screened Positive for Burnout (n = 498)[a]	Nurses Who Did Not Screen Positive for Burnout (n = 605)[b]	*P*[c]
Perceived difference from prepandemic in assigned duties			<0.001
Very different	159 (32)	129 (22)	
Somewhat different	174 (35)	215 (36)	
Somewhat similar	64 (13)	102 (17)	
Very similar	101 (20)	154 (26)	
Increase from prepandemic in hours worked			0.049
Yes	146 (29)	146 (27)	
No	349 (71)	457 (73)	
Redeployed to another type of care or location			0.027
Yes	175 (35)	175 (29)	
No	323 (65)	430 (71)	
Direct patient care duties			0.007
Yes	458 (92)	526 (87)	
No	40 (8)	79 (13)	
Works in general medicine unit			<0.001
Yes	181 (36)	155 (26)	
No	317 (64)	450 (74)	
Works in ICU			<0.001
Yes	149 (30)	128 (21)	
No	349 (70)	477 (79)	
Works in outpatient clinic			0.009
Yes	49 (10)	91 (15)	
No	449 (90)	514 (85)	
Works in emergency department			0.059
Yes	37 (7)	65 (11)	
No	461 (93)	540 (89)	
Works in operating room			0.123
Yes	21 (4)	38 (6)	
No	477 (96)	567 (94)	

Frequencies do not add to column total where responses are missing.
[a]Data are frequency (percent of respondents reporting burnout) or median (range) among nurses reporting burnout.
[b]Data are frequency (percent of total respondents) or median (range) among all nurses.
[c]Differences between nurses who reported burnout versus nurses who did not report burnout were evaluated using the χ^2 test for independence or the Wilcoxon rank sum test.

Table 4. *Multivariable Logistic Regression Analysis of Factors Associated With Burnout During the First and Second Waves of COVID-19*

	First Wave	Second Wave
	Odds Ratio (95% Confidence Interval)	**Odds Ratio (95% Confidence Interval)**
Age (≥35 vs <35 y)	0.66 (0.49-0.89)[a]	0.26 (0.13-0.53)[b]
Gender (female vs male)	2.08 (1.33-3.24)[a]	—
Screened positive for PTSD, GAD, or MDD[c]	3.51 (2.61-4.73)[a]	6.98 (3.06-15.95)[b]
History of burnout prior to COVID-19[c]	3.86 (2.75-5.42)[a]	2.82 (1.35-5.91)[a]
Feeling valued by hospital leadership (continuous)	0.82 (0.69-0.97)[a]	0.44 (0.30-0.65)[b]
Feeling adequately informed about role and clinical duties[c]	0.62 (0.43-0.90)[a]	—
Feeling sense of how long current workload will last[c]	0.67 (0.49-0.93)[a]	—
Feeling that work experience prior to COVID-19 was helpful for performing assigned duties[c]	—	2.94 (1.36-6.37)[a]

PTSD, posttraumatic stress disorder.
[a] Assessed during first wave.
[b] Assessed during second wave.
[c] Yes versus no.

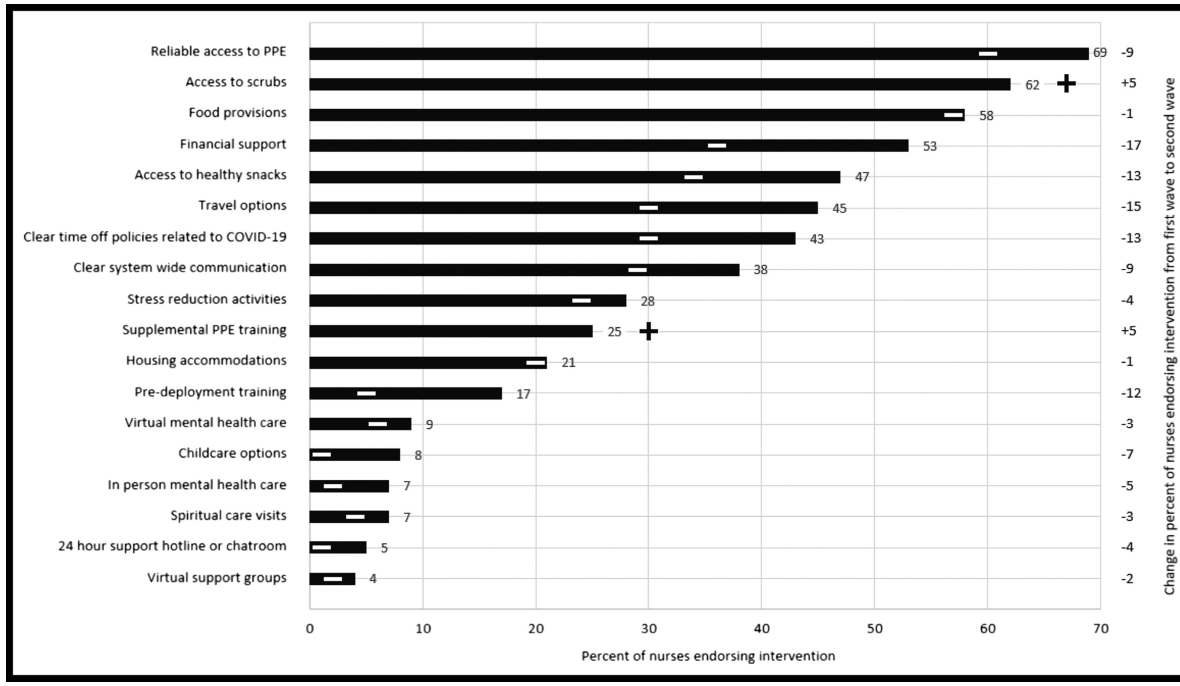

Figure 2. Percent of nurses endorsing proposed interventions to improve well-being during the first (n = 1103) and second (n = 268) waves of COVID-19. Bars represent the percent of respondents endorsing each intervention during the first wave. Plus or minus markers represent the percent of respondents endorsing each intervention during the second wave. The difference in percent of nurses endorsing each intervention between the first and second waves is shown on the right *y* axis.

nonrespondents in unknowable ways. For example, it is possible that nurses who were experiencing burnout or feeling inadequately supported were more likely to respond because they were motivated to express their concerns; alternatively, it is possible that these nurses were less likely to respond if feelings of burnout or inadequate support contributed to exhaustion or apathy. Second, only a quarter of participants in the first survey responded to the second survey (n = 268). Nurses who were lost to follow-up were significantly older with higher medical risk and more years of experience. Loss to follow-up was also slightly more common among nurses reporting burnout, and it is possible that nurses experiencing the most severe burnout left the institution in the months between the initial and follow-up surveys, especially because turnover rates at the institution were slightly higher during 2020 (12.4%) compared with previous years (9.4% and 9.8% in 2018 and 2019, respectively). In addition to selection bias, this study is limited by the use of some survey items that were developed specifically in the context of COVID-19 and therefore have not been previously validated.

Conclusions

Notwithstanding these limitations, this study is one of the first to examine prospective risk factors for nurse burnout during the COVID-19 pandemic in the United States. The data generated provide important guidance for healthcare organizations working to prevent and mitigate burnout among staff during the current pandemic and in future healthcare crises that are similarly prolonged. Results revealed an increase in the prevalence of burnout over time and that feeling undervalued by hospital leadership, uncertainty about how long crisis-level workloads would last, and lack of clarity about one's roles and responsibilities were strongly linked to burnout. Recognizing that leaders face untold challenges, shortages, and uncertainty in the setting of COVID-19, our results suggest that focusing on clear communication, enhanced training for new duties, innovative staffing plans that reduce work hours, and demonstrable acts of appreciation to nursing team members from all levels of management may be most impactful for preventing and mitigating burnout. Although demographic and mental health factors such as age, gender, and PTSD, GAD, or MDD symptoms may not be modifiable, identifying and understanding these risk factors for burnout could help hospital leadership to tailor interventions. Further research is needed to evaluate the efficacy of interventions to address burnout among frontline nurses, particularly in the context of crises such as the COVID-19 pandemic.

References

1. Graystone R. Prevent compassion fatigue and burnout with a Magnet culture. *J Nurs Adm*. 2019;49(5):231-233. doi:10.1097/NNA.0000000000000743.
2. Dall'Ora C, Ball J, Reinius M, Griffiths P. Burnout in nursing: a theoretical review. *Hum Resour Health*. 2020;18(1):41. doi:10.1186/s12960-020-00469-9.
3. Dyrbye LN, Shanafelt TD, Johnson PO, Johnson LA, Satele D, West CP. A cross-sectional study exploring the relationship between burnout, absenteeism, and job performance among American nurses. *BMC Nurs*. 2019;18:57. doi:10.1186/s12912-019-0382-7.
4. Bellanti F, Lo Buglio A, Capuano E, et al. Factors related to nurses' burnout during the first wave of coronavirus disease-19 in a university hospital in Italy. *Int J Environ Res Public Health*. 2021;18(10):5051. doi:10.3390/ijerph18105051.
5. American Nurses Association. Mental Health and Wellness Survey 2. https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/what-you-need-to-know/mental-health-and-wellness-survey-2/. Accesssed June 3, 2022.
6. Garcia CL, Abreu LC, Ramos JLS, et al. Influence of burnout on patient safety: systematic review and meta-analysis. *Medicina (Kaunas)*. 2019;55(9):553. Published August 30, 2019. doi:10.3390/medicina55090553.
7. Dyrbye LN, Shanafelt TD, Sinsky CA, Cipriano PF, Bhatt J, Ommaya A, West CP, Meyers D. 2019. 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, Washington, DC. 10.31478/201707b.
8. Hall LH, Johnson J, Watt I, Tsipa A, O'Connor DB. Healthcare staff wellbeing, burnout, and patient safety: a systematic review. *PLoS One*. 2016;11(7):e0159015. doi:10.1371/journal.pone.0159015.
9. Kelly LA, Gee PM, Butler RJ. Impact of nurse burnout on organizational and position turnover. *Nurs Outlook*. 2021;69(1):96-102. doi:10.1016/j.outlook.2020.06.008.
10. Zhang XJ, Song Y, Jiang T, Ding N, Shi TY. Interventions to reduce burnout of physicians and nurses: an overview of systematic reviews and meta-analyses. *Medicine (Baltimore)*. 2020;99(26):e20992. doi:10.1097/MD0000000000020992.
11. Cañadas-De la Fuente GA, Vargas C, San Luis C, García I, Cañadas GR, De la Fuente EI. Risk factors and prevalence of burnout syndrome in the nursing profession. *Int J Nurs Stud*. 2015;52(1):240-249. doi:10.1016/j.ijnurstu.2014.07.001.
12. Shah MK, Gandrakota N, Cimiotti JP, Ghose N, Moore M, Ali MK. Prevalence of and factors associated with nurse burnout in the US. *JAMA Netw Open*. 2021;4(2):e2036469. doi:10.1001/jamanetworkopen.2020.36469.
13. Yu F, Raphael D, Mackay L, Smith M, King A. Personal and work-related factors associated with nurse resilience: a systematic review. *Int J Nurs Stud*. 2019;93:129-140. doi:10.1016/j.ijnurstu.2019.02.014.
14. Wei H, Roberts P, Strickler J, Corbett RW. Nurse leaders' strategies to foster nurse resilience. *J Nurs Manag*. 2019;27(4):681-687. doi:10.1111/jonm12736.
15. Feingold JH, Peccoralo L, Chan CC, et al. Psychological impact of the COVID-19 pandemic on frontline health care workers during the pandemic surge in New York City. *Chronic Stress (Thousand Oaks, Calif)*. 2021;5:2470547020977891. doi:10.1177/2470547020977891.
16. Li-Sauerwine S, Rebillot K, Melamed M, Addo N, Lin M. A 2-question summative score correlates with the Maslach Burnout Inventory. *West J Emerg Med*. 2020;21(3):610-617. doi:10.5811/westjem.2020.2.45139.
17. Rohland BM, Kruse GR, Rohrer JE. Validation of a single-item measure of burnout against the Maslach Burnout Inventory among physicians. *Stress Health*. 2004;20(2):75-79. doi:10.1002/smi.1002.
18. Geier TJ, Hunt JC, Hanson JL, et al. Validation of abbreviated four- and eight-item versions of the PTSD Checklist for *DSM-5* in a traumatically injured sample. *J Trauma Stress*. 2020;33(3):218-226.
19. Spitzer RL, Kroenke K, Williams JB, et al. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. 2006;166(10):1092-1097.
20. Shin C, Lee SH, Han KM, et al. Comparison of the usefulness of the PHQ-8 and PHQ-9 for screening for major depressive disorder: analysis of psychiatric outpatient data. *Psychiatry Investig*. 2019;16(4):300-305.
21. Sheraton M, Deo N, Dutt T, Surani S, Hall-Flavin D, Kashyap R. Psychological effects of the COVID 19 pandemic on healthcare workers globally: a systematic review. *Psychiatry Res*. 2020;292:113360. doi:10.1016/j.psychres.2020.113360.
22. Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annu Rev Psychol*. 2001;52:397-422. doi:10.1146/annurev.psych.52.1.397.
23. Fernandez R, Lord H, Halcomb E, et al. Implications for COVID-19: a systematic review of nurses' experiences of working in acute care hospital settings during a respiratory pandemic. *Int J Nurs Stud*. 2020;111:103637. doi:10.1016/j.ijnurstu.2020.103637.
24. Rangachari P, L Woods J. Preserving organizational resilience, patient safety, and staff retention during COVID-19 requires a holistic consideration of the psychological safety of healthcare workers. *Int J Environ Res Public Health*. 2020;17(12):4267.
25. Vahey DC, Aiken LH, Sloane DM, Clarke SP, Vargas D. Nurse burnout and patient satisfaction. *Med Care*. 2004;42(2):57-66. doi:10.1097/01.mlr.0000109126.50398.5a.
26. McHugh MD, Kutney-Lee A, Cimiotti JP, Sloane DM, Aiken LH. Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care. *Health Aff (Millwood)*. 2011;30(2):202-210. doi:10.1377/hlthaff.2010.0100.
27. Kutney-Lee A, Wu ES, Sloane DM, Aiken LH. Changes in hospital nurse work environments and nurse job outcomes: an analysis of panel data. *Int J Nurs Stud*. 2013;50(2):195-201. doi:10.1016/j.ijnurstu.2012.07.014.
28. Van Bogaert P, Peremans L, Van Heusden D, et al. Predictors of burnout, work engagement and nurse reported job outcomes and quality of care: a mixed method study. *BMC Nurs*. 2017;16:5. doi:10.1186/s12912-016-0200-4.
29. Obrien N, Flott K, Durkin M. COVID-19: leadership on the frontline is what matters when we support healthcare workers. *Int J Qual Health Care*. 2021;33(1):mzaa153. doi:10.1093/intqhc/.