



IMPACT OF WORKPLACE CLIMATE ON BURNOUT AMONG CRITICAL CARE NURSES IN THE VETERANS HEALTH ADMINISTRATION

By Lakshmana Swamy, MD, MBA, David Mohr, PhD, Amanda Blok, PhD, MSN, PHCNS-BC, Ekaterina Anderson, PhD, Martin Charns, DBA, Renda Soylemez Wiener, MD, MPH, and Seppo Rinne, MD, PhD

Background Burnout is a maladaptive response to work-related stress that is associated with negative consequences for patients, clinicians, and the health care system. Critical care nurses are at especially high risk for burnout. Previous studies of burnout have used survey methods that simultaneously measure risk factors and outcomes of burnout, potentially introducing common method bias.

Objectives To evaluate the frequency of burnout and individual and organizational characteristics associated with burnout among critical care nurses across a national integrated health care system using data from an annual survey and methods that avoid common method bias.

Methods A 2017 survey of 2352 critical care nurses from 94 sites. Site-level workplace climate was assessed using 2016 survey data from 2191 critical care nurses.

Results Overall, one-third of nurses reported burnout, which varied significantly across sites. In multilevel analysis, workplace climate was the strongest predictor of burnout (odds ratio [OR], 2.20; 95% CI, 1.50-3.22). Other significant variables were overall hospital quality (OR, 1.44; 95% CI, 1.05-1.99), urban location (OR, 1.93; 95% CI, 1.09-3.42), and nurse tenure (OR, 2.11; 95% CI, 1.44-3.10). In secondary multivariable analyses, workplace climate subthemes of perceptions of workload and staffing, supervisors and senior leadership, culture of teamwork, and patient experience were each significantly associated with burnout.

Conclusions Drivers of burnout are varied, yet interventions frequently target only the individual. Results of this study suggest that in efforts to reduce burnout, emphasis should be placed on improving local workplace climate. (*American Journal of Critical Care*. 2020;29:380-389)

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Burnout is a maladaptive response to chronic work-related stress that has negative consequences for patients, clinicians, and the health care system in general.^{1,2} Burnout affects the quality of patient care and is associated with an increased incidence of medical errors and reduced patient satisfaction.^{3,4} Clinicians with burnout are more likely to suffer from substance abuse and depression and to experience suicidal ideation.⁵⁻⁷ Furthermore, burnout increases the risk of clinician turnover and compounds health system costs through decreased efficiency and productivity and staff shortages.^{8,9}

Critical care nurses have the highest burnout rates of all nurse specialties, with the condition affecting between a third and more than half of nurses working in the intensive care unit (ICU).¹⁰⁻¹² This high prevalence of burnout may be related to stress from working with critically ill patients, moral distress, and compassion fatigue.^{13,14} Recent studies indicate that workplace climate may play a role in the development of burnout among nurses.^{15,16} Workplace climate is defined as employees' perception of the psychological impact of the work environment.¹⁷

Understanding the relationship between workplace climate and ICU nurse burnout could inform specific and actionable interventions to improve nurse well-being. However, previous research on workplace climate and burnout has been methodologically limited. Workplace climate and burnout measures collected with surveys from the same individual at the same time may introduce common method bias, in which identified variance is attributable to the measurement method rather than to the

constructs that are being measured. Common method bias has been well described in psychology and management literature as one of the most common sources of bias in survey research, but researchers rarely address this form of potential bias directly.¹⁸ Podsakoff et al¹⁸ reviewed the pertinence of the issue and various approaches identified through multiple empirical studies to control this form of bias. The approach we adopted in our study was to introduce temporal separation between predictor and criterion by separating measures of workplace climate and burnout. Few previous studies of burnout have comprehensively evaluated workplace climate, including teamwork on the local unit, interdisciplinary relationships, and connection to leadership. Moreover, the relative importance of workplace climate versus objective individual and organizational characteristics has not been previously addressed.

As the largest integrated health system in the United States, the Veterans Health Administration of the Department of Veterans Affairs (VA) provides an opportunity to study burnout across the nation. Burnout is particularly relevant to VA system operations given nurse staffing shortages due to high turnover and difficulty with recruitment.¹⁹ Understanding contributors to burnout across the VA system could also inform non-VA health systems seeking to address a growing burnout crisis among clinicians.²⁰

Each year, the VA conducts a national all-employee survey (AES), which gathers data on individual demographics, characteristics, and feelings of burnout as well as local workplace climate and organization-level characteristics. We examined individual and organizational risk factors for burnout among ICU nurses working in the VA system using a method that addresses biases associated with cross-sectional data

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About the Authors

Lakshmana Swamy is a pulmonary and critical care fellow at Boston Medical Center and VA Boston, Boston, Massachusetts. **David Mohr** is an investigator at Center for Healthcare Organization and Implementation Research (CHOIR), VA Boston Healthcare System, and a research assistant professor at Boston University School of Public Health, Boston, Massachusetts. **Amanda Blok** is a research health scientist at the VA Center for Clinical Management Research, VA Ann Arbor Healthcare System, and a research assistant professor, Department of Systems, Populations and Leadership, School of Nursing, University of Michigan, Ann Arbor. **Ekaterina Anderson** is a project manager at CHOIR, Edith Nourse Rogers Memorial VA, Bedford, Massachusetts. **Martin Charns** is director emeritus of CHOIR, VA Boston Healthcare System, and a professor of health policy and management at Boston University School of Public Health. **Renda Soylemez Wiener** is an investigator at CHOIR, Edith Nourse Rogers Memorial VA, and a professor at The Pulmonary Center, Boston University School of Medicine. **Seppo Rinne** is an investigator at CHOIR, Edith Nourse Rogers Memorial VA, and a professor at The Pulmonary Center, Boston University.

Corresponding author: Lakshmana Swamy, MD, MBA, Boston University Pulmonary Center, 72 E Concord St, Boston, MA 02118 (email: Lakshmana.Swamy@BMC.org).

common in the burnout literature. We hypothesized that workplace climate would be a significant risk factor for nurse burnout, controlling for individual and organizational characteristics.

Methods

Study Design

This was an observational study using self-reported survey data combined with site characteristics. Individual demographics and organizational characteristics were obtained from the 2017 AES.

Cross-sectional data analysis is prone to common method bias, which can occur when multiple constructs are rated on a survey by the same respondents.

This situation can lead to exaggerated correlations among measures due to psychological phenomena of social desirability, response pattern bias, and item order effects. To address common method bias, we used temporally separated measures of workplace climate and burnout. We regressed individual burnout responses in 2017 on climate scores from the 2016 AES. This approach of using measures from separate surveys conducted at different times is one

way of mitigating common method bias.²¹ The VA Boston Healthcare System institutional review board approved the study.

Survey Instrument

The AES is an annual census survey that is distributed to all active VA employees. The survey is used to collect employee demographic information and assess feelings of burnout through validated questions from the Maslach Burnout Inventory (MBI). It also includes questions designed to comprehensively assess multiple domains of the workplace climate.²² The AES had organization-wide employee response rates of 56.9% in 2016 and 59.5% in 2017. Nursing-specific response rates were 52.6% (36 112 of 68 654) in 2016 and 53.7% (37 526 of 69 864) in 2017.

Study Population

The VA employs approximately 5000 nurses in the ICU setting, who work in more than 200 ICUs with nearly 2000 beds.²³ We filtered AES responses

to include only registered nurses who self-reported their primary service area as “intensive care unit–critical care.” Five respondents who completed less than 80% of the survey items were excluded from analysis. We categorized participants by site and excluded sites with fewer than 5 respondents, resulting in the removal of 46 individuals from 15 sites. Multiple imputation was used to replace a nominal amount of missing values for questions related to workplace climate and individual demographics.²⁴

Primary Outcome: Burnout Measure

Burnout was assessed through 2 single-item MBI statements about depersonalization (“I worry that this job is hardening me emotionally”) and/or emotional exhaustion (“I feel burned out from my work”). Responses were collected in the form of a frequency-based scale from “never” to “every day.” Responses affirming the experience of either feeling “once a week” or more frequently met criteria for burnout. This approach has been validated against standard definitions relying on dichotomized depersonalization and/or emotional exhaustion domains from the complete inventory.²⁵

Workplace Climate Characteristics

The 2016 AES included 52 questions about workplace climate with Likert-scale responses. Items included perceptions of workload and staffing, patient experience, relationships within the work group, and supervisor and senior leadership. Items were generally rated on a 5-point Likert scale with responses ranging from “strongly disagree” to “strongly agree.” We performed a factor analysis, ranked sites by 2016 climate factor score, and divided sites into quartiles such that the highest (fourth) quartile represents the most positive collective perception of the workplace climate. We merged the 2016 site-level quartile score with individual nurses’ responses at that site in 2017.

To examine the impact of different aspects of climate, we divided the workplace climate variables into groups according to the following subthemes: teamwork, perceived patient experience, workload and staffing, and perceptions of leadership at the supervisor and senior levels. Factor analysis for each of these thematic groupings confirmed that the questions in the themes grouped together. We repeated the process just described for each theme, averaging factor scores by site and dividing into quartiles, and then applying the 2016 factor score by quartile to individual nurses at the same site in 2017. We ran the multilevel model again, replacing the global climate factor score with the score for each theme.

We did a factor analysis of 52 survey questions about workplace climate; items included perceptions of workload and staffing, patient experience, relationships within the work group, and supervisor and senior leadership.

Individual Characteristics

The AES collected self-reported information on individual characteristics including sex, race, VA tenure, and supervisory status. Race was categorized as white, Asian, black, other, or unknown. VA tenure was categorized as less than 1 year, 1 to 5 years, 5 to 10 years, 10 to 20 years, or greater than 20 years. Supervisory status was defined as whether or not the respondent had a formal leadership role.

Site-Level Characteristics

We combined the AES data with a list of site characteristics: urban versus nonurban location, membership in the Association of American Medical Colleges Council of Teaching Hospitals ("academic"), overall quality, and ICU complexity. VA medical centers ("sites") use an internal performance improvement tool called SAIL (Strategic Analytics for Improvement and Learning), which combines common private sector metrics with VA metrics for access, quality, nursing turnover, and efficiency. Sites are scored on a scale of 1 to 5, known as "star ratings," to characterize relative performance across a broad set of health care quality measures.²⁶ We used the VA's data-driven model to determine ICU complexity level, which reflects the availability of services (subspecialty, pharmacy, laboratory, and radiologic) with low, medium, and high levels of complexity.

Statistical Analysis

We used χ^2 analyses to characterize ICU nurse burnout by demographic variables, climate factor quartiles, and site-level characteristics. As is standard practice in assessing climate, we averaged individual responses at the site level.²⁷ We conducted hierarchical multivariable regression to examine risk factors for burnout including site-level random effects. As described previously, 5 workplace climate subthemes were derived and individual hierarchical multivariable regression models were run for each subtheme, identical to the initial analysis with the subtheme replacing the overall workplace climate. Statistical analyses were performed with SAS statistical software, version 9.2.

Results

Critical care nurse respondents completed a mean of 98.9% of all questions on the AES in 2016 and 2017. We identified 2352 nurse respondents from 94 sites in 2017 and 2191 nurse respondents in 2016. Approximately one-third of respondents in the 2017 survey (797 of 2352; 33.9%) met criteria for burnout. To capture the maximum variance in

the data set for workplace climate, we conducted a factor analysis, producing a single factor that captured variance of climate with an eigenvalue of 27.52; the resulting factor was used to divide respondents into quartiles by factor score.

Table 1 displays burnout rates by characteristics of respondents and sites. In brief, 76.02% of the respondents were female, 58.59% were white, 61.35% had no supervisory role, and 34.48% had between 1 and 5 years of VA tenure. Of the 94 sites, 88% were in urban areas, 69% had an academic affiliation, 26% had either a 4- or a 5-star rating, and 55% were classified in the highest complexity group.

Multiple variables were significantly associated with burnout in unadjusted analysis: workplace climate ($P < .01$), urban location ($P = .03$), star rating of the site ($P < .01$), and VA tenure ($P < .01$) (Table 1). The relationship between site-level burnout and climate is depicted in the Figure. Higher z scores indicate stronger workplace climate scores.

In multivariable logistic regression analysis, several variables were associated with increased burnout risk (Table 2). Compared with working in sites with the highest workplace climate quartile score, working in the lowest-quartile sites was associated with a higher risk of burnout (odds ratio [OR], 2.20; 95% CI, 1.50-3.22). Compared with VA tenure of less than 1 year, VA tenure of any length between 1 and 20 years was associated with an increased risk of burnout (1-5 years: OR, 1.67; 95% CI, 1.15-2.42; 5-10 years: OR, 2.11; 95% CI, 1.44-3.10; 10-20 years: OR, 1.65; 95% CI, 1.12-2.44). Compared with working at a 4- or 5-star site, working at a site with a rating of 3 stars or fewer was associated with an increased risk of burnout (OR, 1.44; 95% CI, 1.05-1.99).

The results for the workplace climate components were similar to the global climate factor score, with significantly higher risk of burnout for nurses working in the lowest-quartile group in each model (Table 3). Examples of questions included in each subtheme are provided in Table 4.

Discussion

In this nationwide study of ICU nurses, we found that one-third of nurses reported burnout, with substantial variation across sites. Moreover, we identified distinct individual and organizational risk factors for burnout using methods that take into account common method bias, a frequent limitation of research on burnout. We found that site-level perception of

One-third of ICU nurses met criteria for burnout.

Table 1
Unadjusted analysis for nurse-level and site-level characteristics associated with burnout

Characteristic	No. (%) of nurses			P (χ^2)
	Total (N=2352)	Burned out (n=797)	Not burned out (n=1555)	
Nurse-level characteristics				
Sex				.35
Female	1788 (76.02)	615 (77.16)	1173 (75.43)	
Male	564 (23.98)	182 (22.84)	382 (24.57)	
Race				.26
White	1378 (58.59)	467 (58.59)	911 (58.59)	
Asian	464 (19.73)	151 (18.95)	313 (20.13)	
Black	208 (8.84)	63 (7.90)	145 (9.32)	
Other	138 (5.87)	57 (7.15)	81 (5.21)	
Unknown	164 (6.97)	59 (7.40)	105 (6.75)	
Supervisory status				.79
No leadership role	1443 (61.35)	486 (60.98)	957 (61.54)	
Leadership role	909 (38.65)	311 (39.02)	598 (38.46)	
Tenure, y				<.01
<1	208 (8.84)	50 (6.27)	158 (10.16)	
1-5	811 (34.48)	269 (33.75)	542 (34.86)	
5-10	576 (24.49)	227 (28.48)	349 (22.44)	
10-20	511 (21.73)	176 (22.08)	335 (21.54)	
>20	246 (10.46)	75 (9.41)	171 (11.00)	
Site-level characteristics				
Urban vs not urban				.03
Urban	2229 (94.77)	766 (96.11)	1463 (94.08)	
Not urban	123 (5.23)	31 (3.89)	92 (5.92)	
Academic vs not academic				.29
Academic	1890 (80.36)	650 (81.56)	1240 (79.74)	
Not academic	462 (19.64)	147 (18.44)	315 (20.26)	
Star rating				<.01
5	132 (5.61)	34 (4.27)	98 (6.3)	
4	451 (19.18)	126 (15.81)	325 (20.9)	
3	1039 (44.18)	364 (45.67)	675 (43.41)	
2	575 (24.45)	207 (25.97)	368 (23.67)	
1	155 (6.59)	66 (8.28)	89 (5.72)	
Climate factor				<.01
Highest	571 (24.28)	156 (19.57)	415 (26.69)	
Mid-high	561 (23.85)	164 (20.58)	397 (25.53)	
Mid-low	629 (26.74)	209 (26.22)	420 (27.01)	
Lowest	591 (25.13)	268 (33.63)	323 (20.77)	
Intensive care unit complexity				.19
High	1737 (73.85)	601 (75.41)	1136 (73.05)	
Medium	314 (13.35)	108 (13.55)	206 (13.25)	
Low	301 (12.80)	88 (11.04)	213 (13.70)	

workplace climate was the strongest predictor of burnout, surpassing individual and other organization-level predictors. Our findings are consistent with previous research, including the conceptual model of Moss et al¹³ that emphasizes the role of personal characteristics, organizational factors, and the ICU environment in the development of clinician burnout. However, the finding that climate was the strongest predictor of burnout is novel and may have implications for future efforts to address burnout. Such efforts should incorporate comprehensive measures to improve various elements of workplace climate,

complementing the existing programs that are largely focused on developing individual clinician resilience.²⁸ Our study also points to other organizational (medical center quality) and individual-level (tenure) factors that those working to combat burnout should take into consideration.

Workplace Climate

Workplace climate is a complex construct that reflects employees' emotional and psychological response to the overall work environment. Distinct aspects of the workplace climate may differentially

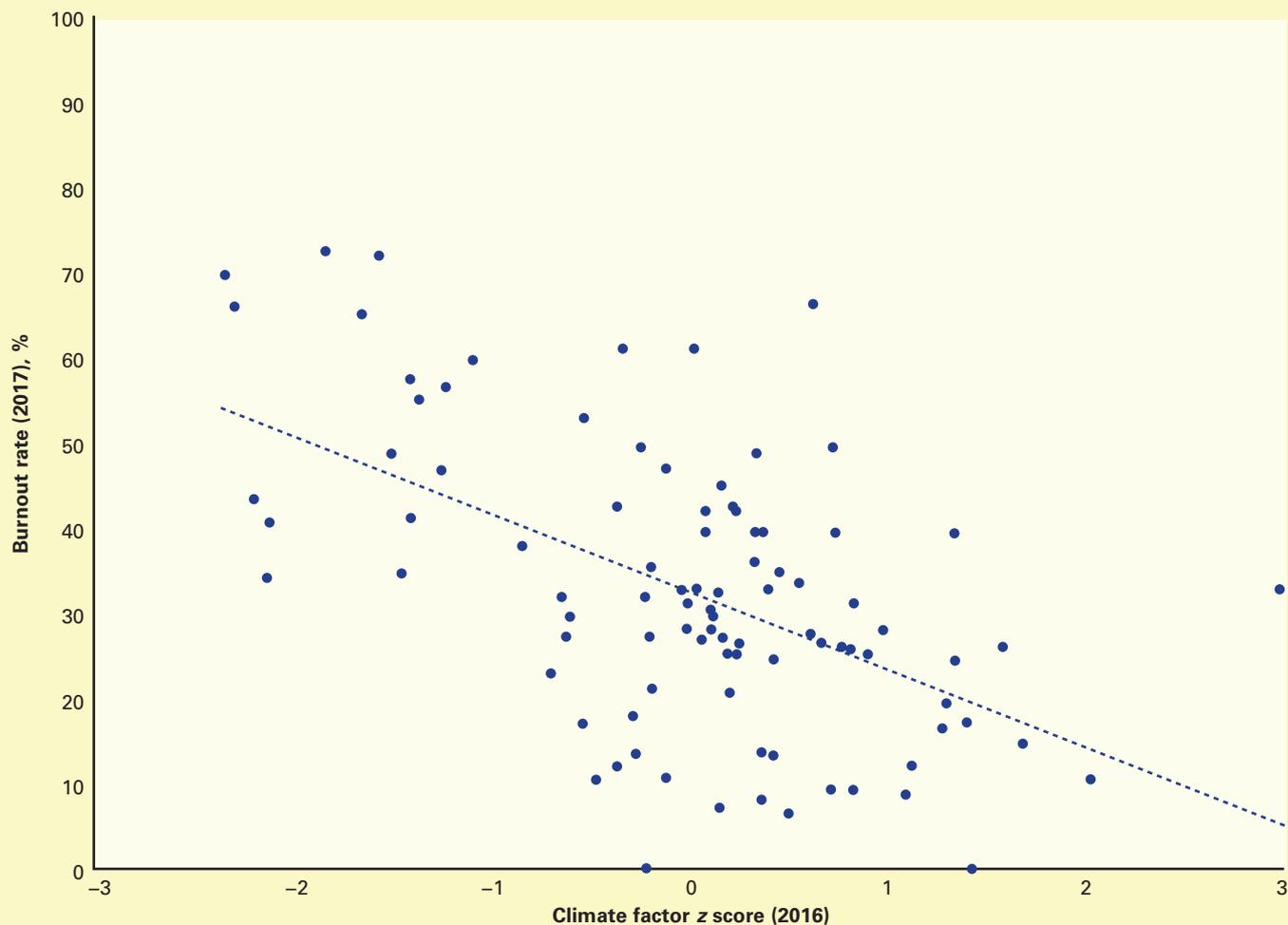


Figure Relationship between site-level burnout rate and climate factor score.

affect feelings of burnout. In our secondary analysis, we examined several aspects of workplace climate: perceptions of teamwork, patient experience, workload, supervisors, and senior leadership. We found that all 5 of these subthemes were individually significant in unique multivariable analyses, suggesting that each subtheme represents a potentially important contributor to burnout. Interventions to promote ICU nurse well-being may need to consider systemic changes that affect diverse components of climate.

Workplace climate is a broad concept with a foundation in interpersonal relationships. In the ICU, relationships with patients, multidisciplinary team members, local supervisors, and senior leadership can all influence clinician well-being. Healthy workplace climates are characterized by relationships that are based on mutual respect, psychological safety, and a spirit of teamwork and cooperation. In the absence of these positive relational characteristics, conflicts may arise, which can lead to higher rates of clinician burnout.^{29,30} Specific conflicts concerning the patient experience could manifest

as moral distress, a well-documented phenomenon that is also associated with burnout.³¹

Improving relationships in the ICU may require transformational change that engages all members of clinical teams,³² and local leaders can play a critical role in facilitating these transformations and promoting better working relationships.³³ Although the role of leadership in combating burnout cannot be overstated, a poor perception of leadership may be a major contributor to burnout, as suggested by our secondary analyses showing that climate themes related to local supervisors and senior leadership were both significantly associated with burnout. This poor perception may be due to perceived inequity, lack of recognition, or poor communication from

In the ICU, relationships with patients, multidisciplinary team members, local supervisors, and senior leaders can all influence clinician well-being.

Table 2
Hierarchical multivariable analysis for nurse-level and site-level characteristics associated with burnout

Characteristics	Odds ratio	95% CI
Nurse-level characteristics		
Male	0.89	0.72-1.11
Race		
White	Reference	—
Black	0.71	0.50-1.00
Asian	0.85	0.65-1.11
Other	1.29	0.88-1.90
Unknown	0.95	0.66-1.37
Tenure, y		
<1	Reference	—
1-5	1.67	1.15-2.42
5-10	2.11	1.44-3.10
10-20	1.65	1.12-2.44
>20	1.26	0.81-1.98
Supervisory status	1.01	0.83-1.22
Site-level characteristics		
Climate factor		
Highest	Reference	—
Mid-high	1.05	0.70-1.57
Mid-low	1.23	0.83-1.81
Lowest	2.20	1.50-3.22
Urban	1.93	1.09-3.42
Star rating		
4 or 5	Reference	—
1, 2, or 3	1.44	1.05-1.99
Intensive care unit complexity		
High	Reference	—
Medium	0.87	0.59-1.29
Low	0.80	0.54-1.16

Table 3
Risk of burnout by climate subtheme^a

Subtheme	Odds ratio	95% CI
Patient experience		
Lowest	2.08	1.43-3.04
Mid-low	0.83	0.57-1.20
Mid-high	0.78	0.54-1.12
Highest	Reference	—
Workload and staffing		
Lowest	2.27	1.50-3.42
Mid-low	1.63	1.10-2.40
Mid-high	1.09	0.73-1.62
Highest	Reference	—
Intensive care unit teamwork		
Lowest	2.12	1.43-3.13
Mid-low	1.26	0.86-1.87
Mid-high	0.90	0.61-1.33
Highest	Reference	—
Supervisor/middle management		
Lowest	2.27	1.55-3.32
Mid-low	1.41	0.92-2.16
Mid-high	1.17	0.81-1.69
Highest	Reference	—
Senior leadership and mission		
Lowest	2.57	1.70-3.88
Mid-low	1.33	0.92-1.92
Mid-high	0.94	0.64-1.39
Highest	Reference	—

^aUnique multivariable models for each factor.

leaders.^{34,35} Interventions to promote clinician well-being should include approaches to engage leaders in creating a better workplace climate.³⁶

Medical Center Quality

Our analysis also revealed significant associations between the overall medical center quality of care (“star rating”) and burnout. Although far from perfect,³⁷ star ratings provide a global assessment of quality of care. Critical care nurses at sites with a 1-, 2-, or 3-star rating were more likely to report burnout than those at 4- or 5-star facilities. Numerous studies have shown an association between burnout and low quality of care, often focusing on the potential for burnout to cause low-quality care.^{3,38-42} For example, working in an ICU with significant delays in extubation, a high rate of hospital-acquired infections, and delays in appropriate treatment may negatively affect the bedside nurse experience and contribute to burnout,³⁸ or a third factor such as the work climate may affect both burnout and quality of care.^{16,42} Less investigation has addressed the possibility that burnout may be a result of working in environments with worse objective markers of quality. It is unclear whether burnout leads to poor quality of care or working in a low-quality environment promotes burnout; indeed, the effect may be bidirectional, or a third factor such as the impact of leadership or resources could drive both burnout and low quality. Regardless of the causal association, low-quality sites could provide a target population for future interventions to improve clinician well-being.

Individual Factors

Although individual characteristics are prominent components of burnout-related conceptual frameworks,^{13,43} the demographic characteristics that we studied were not significantly associated with ICU nurse burnout. We did find a nonlinear association between VA tenure and burnout, with the lowest burnout rates among clinicians working less than 1 year and those working more than 20 years. Low burnout rates among new nurses may reflect a “honeymoon period” of high job satisfaction,⁴⁴ whereas the low burnout rate among long-tenure nurses likely reflects a survivorship bias due to higher turnover of burned-out nurses.¹³ Notably, our individual analysis was largely limited to demographic characteristics, and we did not have access to other potential burnout risk factors, such as current or prior mental health conditions.⁴⁵

Table 4
Examples of survey questions from subthemes

Subtheme	Survey questions
Perceived workload	How satisfied are you with the amount of work that you currently do? My workload is reasonable given my job. We have enough staff in my work group to meet workload demands. We have the right mix of staff in my work group to meet workload demands.
Perceived patient experience	How satisfied do you think other Veterans Affairs employees are with the products and services provided by the place where you work? How satisfied do you think veterans and their families are with the products and services provided by the place where you work?
Work group relationships	Considering everything, how satisfied are you with your work group? People treat each other with respect in my work group. A spirit of cooperation and teamwork exists in my work group. Members of my work group communicate well with each other.
Perceptions of supervisor	I have an effective working relationship with my supervisor. My supervisor does not engage in favoritism. My supervisor encourages people to speak up when they disagree with a decision. I can talk with my direct supervisor about ethical concerns without fear of having my comments held against me.
Perceptions of organizational leadership	I recommend my facility as a good place to work. Considering everything, how satisfied are you with your organization? How satisfied are you with the job being done by the executive leadership where you work?

Limitations

We defined burnout as a dichotomous syndrome using 2 single-item questions from the MBI. Although this approach has been validated against the full MBI, it may not describe the full spectrum of clinician experiences.²⁵ We evaluated workplace climate at the medical center level, but medical centers may have any combination of medical, cardiac, and surgical ICUs, which could have variations in local climate.⁴⁶ Without interview and observational data, we were not able to evaluate differences between the ICUs within sites. Intensive care unit–related factors such as end-of-life care, ethical issues, and bearing witness to trauma may also play a significant role in the development of burnout but were not addressed in this investigation, and we did not have access to objective measures of workload.

Workplace climate in the VA system is unique, and our findings may not be generalizable to the private sector. Approximately one-third of VA employees are active or retired members of the military, which may affect their commitment to the VA mission and engagement with their work.⁴⁷ The VA also has a unique pension system that may provide an incentive to stay within the VA system, although previous studies on financial incentives and burnout have found a weak association,⁴⁸ and this single factor is unlikely to keep burned-out nurses working longer. Our study methodology used workplace climate measures from 2016 and burnout measures from 2017. Other factors could affect burnout over the course of a year, including increased awareness of burnout and intentional promotion of clinician

wellness,⁴⁹ changes in management support,⁵⁰ and other unmeasured variables. Of note, sensitivity analyses we conducted with climate and burnout data collected concurrently from respondents in the 2017 survey indicated a similar relationship to that of the 2016-2017 data presented here.

The relationship we found between burnout and the overall quality of the medical center was based on SAIL star ratings assigned by the VA. These ratings are a general quality measure for the hospital as a whole but do not directly reflect ICU quality. Moreover, the star rating system itself is being retired in favor of another system that allows comparison between VA and public hospitals.⁵¹

Finally, the potential exists for self-selection bias among nurses who complete the AES, as burnout or other factors may have a significant impact on survey response rates.

Conclusion

Our results emphasize the importance of several aspects of the local workplace climate as potential contributors to burnout. Many organizations pursue an individual approach to burnout, focusing on building resilience.²⁸ In contrast, our investigation indicated that workplace climate may be an important target for interventions to promote clinician

Healthy workplace climates are characterized by relationships that are based on mutual respect, psychological safety, and a spirit of teamwork and cooperation.

well-being. Nurse managers and senior leadership can play an important role in facilitating and promoting these wellness interventions. Future research should consider group perceptions of the local workplace climate as an important contributor to the development of burnout in ICU nurses.

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SEE ALSO

For more about burnout, visit the AACN *Advanced Critical Care* website, www.aacnconline.org, and read the article by Fitzpatrick et al, "Joy in Work and Reducing Nurse Burnout: From Triple Aim to Quadruple Aim" (Summer 2019).

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CE 1.0 Hour Category C

Notice to CE enrollees:

This article has been designated for CE contact hour(s). The evaluation demonstrates your knowledge of the following objectives:

1. Define burnout in the intensive care unit.
2. Evaluate the frequency of burnout and individual and organizational characteristics associated with burnout among critical care nurses.
3. Describe the impact of the workplace climate on the development of burnout.

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