CRITICAL CARE NURSES' PHYSICAL AND MENTAL HEALTH, WORKSITE WELLNESS SUPPORT, AND MEDICAL ERRORS

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CE 1.0 Hour

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Background Critical care nurses experience higher rates of mental distress and poor health than other nurses, adversely affecting health care quality and safety. It is not known, however, how critical care nurses' overall health affects the occurrence of medical errors.

Objective To examine the associations among critical care nurses' physical and mental health, perception of workplace wellness support, and self-reported medical errors.

Methods This survey-based study used a cross-sectional, descriptive correlational design. A random sample of 2500 members of the American Association of Critical-Care Nurses was recruited to participate in the study. The outcomes of interest were level of overall health, symptoms of depression and anxiety, stress, burnout, perceived worksite wellness support, and medical errors.

Results A total of 771 critical care nurses participated in the study. Nurses in poor physical and mental health reported significantly more medical errors than nurses in better health (odds ratio [95% CI]: 1.31 [0.96-1.78] for physical health, 1.62 [1.17-2.29] for depressive symptoms). Nurses who perceived that their worksite was very supportive of their well-being were twice as likely to have better physical health (odds ratio [95% CI], 2.16 [1.33-3.52]; 55.8%).

Conclusion Hospital leaders and health care systems need to prioritize the health of their nurses by resolving system issues, building wellness cultures, and providing evidence-based wellness support and programming, which will ultimately increase the quality of patient care and reduce the incidence of preventable medical errors. (*American Journal of Critical Care.* 2021;30:176-184)

In 2017, the National Academy of Medicine (NAM) launched the Action Collaborative for Clinician Well-being and Resilience in response to increased rates of burnout, depression, and suicide and their adverse effects on clinician well-being and patient safety.[1] A national US study of 1790 practicing nurses from 19 health care systems indicated that worse physical and mental health of nurses was related to a greater number of reported medical errors.[2] That study was the first to demonstrate that depression was the leading predictor of medical errors among nurses. Furthermore, nurses who perceived greater support for wellness at their worksite had better physical and mental health outcomes. Yet that national study did not specifically examine health and medical errors of critical care nurses (CCNs) or the relationship of those factors to perceived wellness support.

Critical care nurses are known to experience higher levels of stress than nurses in other specialties because of their complex clinical environment, which includes high patient acuity, increased use of advanced technology, and frequent exposure to loud alarms and fluorescent light sources.[3] Their physical health is negatively affected by long shifts with limited breaks to rest properly, often resulting in sleep disruption, headaches, cardiovascular disease, gastrointestinal symptoms, and musculoskeletal disorders.[4-6] The mental health of CCNs is also adversely affected by their work with critically ill patients, which includes frequent exposure to traumatic events and the need to regularly deal with ethical issues that arise.[3]

Research findings indicate that CCNs have high rates of posttraumatic stress disorder, burnout, anxiety, and depression.[7-9] One study showed a 24% prevalence rate of posttraumatic stress disorder in CCNs, compared with 15% in nurses working in other clinical areas.[7] Regarding burnout, a systematic review of 206 studies of CCNs indicated a prevalence ranging from 6% to 47%.[10] Additional prevalence studies have shown that 23% to 28% of CCNs report anxiety and 15% to 30% experience depression.[7,11] In comparison, the 12-month prevalence rate of depression in the general US population is 10%.[12] The rates of mental health problems in CCNs are expected to increase even further as the COVID-19 pandemic continues to amplify fears about contraction and transmission in addition to inconsistent availability of ventilators and personal protective equipment.[13,14]

Medical errors are the third leading cause of death in the United States, resulting in more than 250 000 deaths per year.[15] Errors occur more frequently in critical care units because of complex patient cases and multiple-system illnesses, which introduce more opportunity for human error.[16] Previous studies have demonstrated positive associations between medical errors and clinician stress, quality of life, burnout, and physical and mental health.[17-20] Few studies have examined these associations in CCNs. The effect of perceived worksite wellness support on CCNs' health and medical error occurrence is also not known. Therefore, the aims of this study were to

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(1) describe CCNs' physical and mental health (symptoms of depression, anxiety, stress, and burnout), (2) assess the relationships between CCNs' physical and mental health and medical errors, and (3) examine the association between CCNs' perceptions of worksite wellness support and their physical and mental health.

Methods

Design

This study used a cross-sectional, descriptive correlational design. The institutional review board at the study site deemed the study protocol exempt from the need for approval. Data were collected from August 31, 2018, through August 11, 2019.

Population

A simple random sample of 2500 members of the American Association of Critical-Care Nurses (AACN) was recruited to participate in this study after the entire AACN membership was initially contacted and informed about the opportunity. The study survey was administered through Qualtrics, an online survey software program. An anonymous survey link was emailed or mailed directly to the AACN members; of the 2500 members contacted, 1139 agreed to participate (response rate, 45.6%). Once the email link or QR code was activated and before starting the survey, participants provided consent through an online consent form. Data gathered were anonymous and did not have any of the 18 HIPAA (Health Insurance Portability and Accountability Act)[21] privacy rule identifiers. To examine the relationship among CCNs' health, perceived worksite wellness support, and medical errors, we analyzed data only from participants whose primary role was in clinical practice (N = 771).

> Critical care nurses have high rates of posttraumatic stress disorder, burnout, anxiety, and depression.

Study Measures

Demographic data collected included sex, marital status, ethnic background, number of children in the home, age, educational attainment, and history of chronic illness. Participants also rated their physical and mental health on a scale of 0 to 10, with higher scores representing better health.

The valid and reliable 2-question Patient Health Questionnaire-2 (PHQ-2) was used to screen for depressive symptoms.[22] In this measure, 2 questions are asked about feeling down, depressed, and hopeless and experiencing an inability to feel pleasure in the past 2 weeks. Participants rated their depressive symptoms using a 4-point Likert-type scale from 0 (not at all) to 3 (nearly every day). The Cronbach α for the instrument with this sample was 0.76.

The Generalized Anxiety Disorder Questionnaire-2 (GAD-2), a valid and reliable screening tool, was used to screen for symptoms of anxiety.[23] The measure includes questions about the presence of anxiety symptoms (feeling nervous, anxious, or on edge and not being able to stop or control worrying) in the past 2 weeks. Participants rated their anxiety symptoms on a 4-point Likert-type scale with scores ranging from 0 (not at all) to 3 (nearly every day). The Cronbach α with this sample was 0.74.

The valid and reliable Perceived Stress Scale-4 (PSS-4) is a 4-question instrument used to measure perception of stress.[24,25] The score is generated by calculating the sum of all 4 items, with reverse scoring on 2 of the questions. Higher scores are correlated with higher perceived stress. The Cronbach α for this sample was 0.65.

Four questions from the Professional Quality of Life Scale (ProQOL) were used to assess burnout: "I feel worn out because of my work"; "I feel trapped by my job"; "I am not as engaged with my patients today as I used to be"; and "I believe I can make a difference through my work."[26,27] Participants rated each item on a Likert-type scale from 1 (never) to 5 (very often). The Cronbach α with this sample was 0.39 and was improved to 0.78 after we removed the item "I believe I can make a difference through my work."

Perceived workplace wellness support was assessed by asking "How supportive is your work environment of personal wellness?" Participants rated this question using a Likert-type scale that ranged from 0 (not at all) to 4 (very much so).

Medical errors were defined as "preventable adverse effects of care." Participants reported the number of medical errors they had made in the past 5 years. Response options were none, 1 to 2, 3 to 5, or more than 5.

Statistical Analysis

Descriptive statistics were used to summarize sample characteristics, CCNs' health, and the proportion of nurses having any medical errors in the past 5 years. Bivariate tests (eg, χ^2 test) were used to examine the associations of nurses' health with medical errors and with workplace wellness support.

For multiple regression analyses, each health measure was analyzed separately and dichotomized as a better or worse health category. Better health

categories included better physical health (self-rated physical health score of 6-10), better mental health (self-rated mental health score of 6-10), no symptoms of depression (PHQ-2 score of 0), no symptoms of anxiety (GAD-2 score of 0), no or little stress (PSS-4 score of ≤4), and high professional quality of life (ProQOL-4 score of ≥12). Worse health categories included worse physical health (self-rated physical health score of 0-5), worse mental health (self-rated mental health score of 0-5), presence of depressive symptoms (PHQ-2 score of ≥1), presence of anxiety symptoms (GAD-2 score of ≥1), presence of stress (PSS-4 score of 5-12), and low professional quality of life (ProQOL-4 score of 0-11).

Multiple logistic regression models were used to examine the relationship between CCNs' health (independent variable) and the odds of having made medical errors in the past 5 years (dependent variable), adjusting for covariates (nurses' age, sex, race/ethnicity, marital status, educational degree, and hours of work per day or shift). We also conducted sensitivity analyses treating health measures as continuous variables using multiple logistic regression for the associations of health (independent variable) and multiple linear regression for the associations of workplace support of wellness (independent variable) and health (dependent variable). The reliability of the ProQOL measure improved from 0.39 to 0.78 after the item "I believe I can make a difference through my work" was removed, suggesting that this item did not measure the same underlying construct as the other 3 items of the ProQOL measure. To examine its impact on study findings, we also repeated the analyses after removing the item "I believe I can make a difference through my work" from the ProQOL-4 measure. All of the analyses had similar findings. Therefore, the results are presented primarily by analyzing the health measures as dichotomous variables for ease of understanding. We used SAS version 9.4 (SAS Institute) for all of the analyses.

Results

Descriptive Analysis

Of the 771 CCNs whose primary role was clinical practice, the majority were female (n = 711; 92.2%), non-Hispanic White (n = 643; 83.4%), and married or in a relationship (n = 570; 74.0%). The mean (SD) age was 39.9 (12.8) years. More than half (n = 440; 57.7%) of the nurses were between 25 and 44 years of age. A total of 101 (13.1%) of the nurses had an associate's degree or diploma, 517 (67.1%) had a bachelor of science in nursing degree, 120 (15.6%) had a master's degree, and 10 (1.3%) had a doctorate.

Table 1
Characteristics of 771 critical care nurses who responded to the survey

Characteristic	No. (%)[a]
Age, years (mean [SD], 39.9 [12.8] y)	
<25	55 (7.2)
25-34	290 (38.1)
35-44	150 (19.7)
45-54	122 (16.0)
55-64	125 (16.4)
≥65	20 (2.6)
Sex	
Male	60 (7.8)
Female	711 (92.2)
Race/ethnicity	
Non-Hispanic White	643 (83.4)
Non-Hispanic Black	26 (3.4)
Hispanic	3 (0.4)
American Indian/Alaskan Native	46 (6.0)
Asian/Pacific Islander	31 (4.0)
Multiracial/other	22 (2.8)
Marital/relationship status	
Married or in a relationship	570 (74.0)
Never married, divorced, or widowed	200 (26.0)
Degree	
Associate's or diploma	101 (13.1)
Bachelor of science in nursing	517 (67.1)
Master's	120 (15.6)
Doctorate	10 (1.3)
Other	22 (2.9)
Hours of work per day or shift	
<8	3 (0.4)
8	63 (8.2)
9-10	87 (11.3)
11-12	92 (11.9)
>12	526 (68.2)

[a] The percentages are based on nonmissing values. Number and percentage of missing data: age (9, 1.2%), marital/relationship status (1, 0.1%), and degree (1, 0.1%).

A majority (n = 705; 91.4%) of the nurses worked more than 8 hours per day, and more than two-thirds of the nurses reported that their typical workday or shift was longer than 12 hours (Table 1).

The CCNs reported suboptimal health, with 470 (61.0%) reporting a physical health score of 5 or lower and 393 (51.0%) reporting a mental health score of 5 or lower (Table 2). A substantial proportion of nurses reported some degree of depressive symptoms (n = 304; 39.5%), anxiety symptoms (n = 409; 53.2%), and stress (n = 325; 42.2%). Only about a third of the nurses (n = 307; 39.8%) reported high professional quality of life. Nearly two-thirds (60.9%) of the CCNs reported having made medical errors in the past 5 years. For all of the health measures (physical health, mental health, PHQ-2, GAD-2, PSS-4, and ProQOL-4), the occurrence of medical errors was significantly higher among nurses in worse health than those in the better

Table 2
Associations between critical care nurses' self-reported physical and mental health and the occurrence of medical errors

Characteristic	No. (%) of nurses	Having medical error(s) in the past 5 years	
		%	Adjusted odds ratio (95% CI)[a]
Overall	771 (100)	60.9	Not applicable
Physical health			
0-5	470 (61.0)	63.1	1.31 (0.96-1.78)
6-10 (better)	301 (39.0)	57.5	Reference
Mental health			
0-5	393 (51.0)	65.9	1.49 (1.09-2.04)
6-10 (better)	377 (49.0)	55.7	Reference
PHQ-2			
0 (no depressive symptoms)	466 (60.5)	56.6	Reference
≥1	304 (39.5)	67.7	1.62 (1.17-2.29)
GAD-2			
0 (no anxiety symptoms)	360 (46.8)	55.0	Reference
≥1	409 (53.2)	66.2	1.58 (1.16-2.16)
PSS-4			
0-4 (no/little stress)	446 (57.8)	56.5	Reference
5-12	325 (42.2)	67.0	1.53 (1.18-2.10)
ProQOL-4			
0-11	464 (60.2)	63.2	1.34 (0.98-1.83)
12-16 (high professional QOL)	307 (39.8)	57.5	Reference

Abbreviations: GAD-2, Generalized Anxiety Disorder Questionnaire-2; PHQ-2, Patient Health Questionnaire-2; ProQOL-4, Professional Quality of Life Scale; PSS-4, Perceived Stress Scale-4; QOL, quality of life.

[a] Derived from multiple logistic regression models. Dependent variable was medical error; independent variables were each health measure; covariates were age, sex, race/ethnicity, marital status, degree, and hours of work per day or shift.

health categories. For example, 67.0% of the nurses with higher stress scores versus 56.5% of the nurses with no or little stress reported having made medical errors in the past 5 years.

Logistic Regression

The association between the nurses' health measures and medical errors was sustained after adjusting for age, sex, race/ethnicity, marital status, education, and hours of work per day or shift. Compared with nurses reporting better health, those with worse health had a 31% (odds ratio [OR], 1.31; 95% CI, 0.96-1.78 for physical health) to 62% (OR, 1.62; 95% CI, 1.17- 2.29 for depressive symptoms) higher likelihood of having made medical errors (Table 2).

The proportion of nurses with better physical health (self-reported physical health score ≥6) increased with higher perceived workplace wellness support: 32.9%, 38.0%, and 55.8% for not at all/a little, somewhat, and very much support, respectively (Table 3). The same trend was also observed for all of the other health measures, including mental health, depressive symptoms, anxiety symptoms, stress, and professional quality of life.

The significant relationship between greater perceived support of wellness and better health held after adjusting for nurses' age, sex, race/ethnicity, marital status, education, and hours of work per day or shift in the multiple logistic regression models. Compared with nurses whose workplaces provided little or no support, those whose workplaces provided greater support for wellness were more than twice as likely to have better personal health, with

Table 3
Relationship between perceived support of worksite wellness and nurses' health

Nurses' health	Perceived support of wellness at the place of employment				
	%			Adjusted odds ratio (95% CI)[a]	
	Not at all/a little (n=234)	Somewhat (n=424)	Very much (n=113)	Very much vs not at all/a little	Somewhat vs not at all/a little
Better physical health	32.9	38.0	55.8	2.16 (1.33-3.52)	1.20 (0.84-1.71)
Better mental health	37.2	50.5	67.3	2.68 (1.62-4.46)	1.61 (1.13-2.28)
No depressive symptoms	50.0	61.1	79.6	3.23 (1.87-5.60)	1.52 (1.08-2.14)
No anxiety symptoms	36.3	45.8	71.7	3.99 (2.38-6.69)	1.38 (0.97-1.94)
No/little stress	48.7	57.8	77.0	3.25 (1.91-5.56)	1.37 (0.98-1.92)
High professional quality of life	20.9	42.2	69.9	8.96 (5.21-15.42)	2.96 (2.00-4.36)

[a] Derived from logistic regression models. Dependent variable was each health measure; independent variable was perceived support of wellness at the place of employment; covariates were age, sex, race/ethnicity, marital status, degree, and hours of work per day or shift.

Table 4
Health measures, analyzed as continuous variables, and their association with having medical errors in the past 5 years

Health measure	Score, mean (SD)			Adjusted odds ratio (95% CI)[a]
	All	No medical error	Having medical error	
Physical health score	6.81 (1.77)	6.92 (1.82)	6.75 (1.74)	0.95 (0.87-1.03)
Mental health score	7.18 (1.91)	7.44 (2.00)	7.01 (1.84)	0.90 (0.82-0.98)
Depressive symptoms (PHQ-2)	0.83 (1.32)	0.73 (1.33)	0.90 (1.31)	1.10 (0.98-1.25)
Anxiety symptoms (GAD-2)	1.18 (1.50)	0.99 (1.40)	1.30 (1.54)	1.15 (1.03-1.28)
Stress (PSS-4)	4.51 (3.15)	4.17 (3.04)	4.73 (3.20)	1.06 (1.01-1.12)
ProQOL	10.13 (3.38)	10.39 (3.65)	9.97 (3.18)	0.96 (0.92-1.01)

Abbreviations: GAD-2, Generalized Anxiety Disorder Questionnaire-2; PHQ-2, Patient Health Questionnaire-2; ProQOL, Professional Quality of Life Scale; PSS-4, Perceived Stress Scale-4.

[a] Estimated from multiple logistic regression models. Dependent variable was medical error; independent variables were each health measure and covariates (age, sex, race/ethnicity, marital status, degree, and hours of work per day or shift).

Table 5
Health measures, analyzed as continuous variables, and their association with perceived worksite wellness support

Health measure	Perceived support of wellness at the place of employment				
	Score, mean (SD)			Coefficient (SE)[a]	
	Not at all/a little	Somewhat	Very much	Somewhat vs not at all/a little	Very much vs not at all/a little
Physical health score	6.46 (1.90)	6.84 (1.68)	7.43 (1.66)	0.35 (0.14)[b]	0.81 (0.20)[c]
Mental health score	6.67 (2.05)	7.24 (1.79)	8.03 (1.74)	0.43 (0.15)[d]	1.06 (0.21)[c]
Depressive symptoms (PHQ-2)	1.18 (1.58)	0.73 (1.12)	0.50 (1.30)	−0.41 (0.11)[c]	−0.54 (0.15)[c]
Anxiety symptoms (GAD-2)	1.57 (1.70)	1.11 (1.39)	0.62 (1.20)	−0.38 (0.12)[d]	−0.81 (0.17)[c]
Stress (PSS-4)	5.29 (3.23)	4.47 (3.09)	3.05 (2.66)	−0.73 (0.25)[d]	−2.02 (0.35)[c]
ProQOL	8.39 (3.50)	10.50 (3.00)	12.36 (2.62)	2.11 (0.25)[c]	3.82 (0.36)[c]

Abbreviations: GAD-2, Generalized Anxiety Disorder Questionnaire-2; PHQ-2, Patient Health Questionnaire-2; ProQOL, Professional Quality of Life Scale; PSS-4, Perceived Stress Scale-4.

[a] Estimated from multiple linear regression models. Dependent variable was each health measure; independent variable was perceived support of wellness at the place of employment and covariates (age, sex, race/ethnicity, marital status, degree, and hours of work per day or shift).
[b] $P<.05$.
[c] $P<.001$.
[d] $P<.01$.

ORs ranging from 2.16 (95% CI, 1.33-3.52) for better physical health to 8.96 (95% CI, 5.21-15.42) for high professional quality of life. Nurses whose workplace provided some support also had higher odds of having better health and professional quality of life compared with those whose workplace provided little or no support after adjusting for other covariates in the model, with ORs ranging from 1.20 (95% CI, 0.84-1.71) for better physical health to 2.96 (95% CI, 2.00-4.36) for high professional quality of life. We found similar associations of health with medical errors (Table 4) and workplace wellness support (Table 5) when analyzing health measures as continuous variables. We also found similar associations in the analyses removing the item "I believe

I can make a difference through my work" from the ProQOL-4 measure.

Discussion

This study's findings provide support for a strong positive association between suboptimal physical and mental health in CCNs and the occurrence of medical errors. Nearly 40% of CCNs in this study reported some degree of depressive symptoms, and more than 50% reported anxiety symptoms, proportions that are higher than those that have been reported in other studies of CCNs (depression, 23%-31%; anxiety, 18%-20%).[7,9] Unresolved depression can lead to suicidal ideation and action, which have been on the rise and occur at a higher rate in nurses than in the general

population.[28] Therefore, health care leaders need to implement screening programs that detect symptoms of depression in their clinicians so that evidence-based treatment can be made available. One successful program is the HEAR (Healer Education Assessment and Referral) screening program, which provides anonymous online depression screening and treatment referral[28,29] and is patterned after a program developed by the American Foundation for Suicide Prevention.[30] Since its inception, the program has successfully identified a substantial number of suicidal nurses and connected them with treatment options.

A key study finding is that nurses who perceived high levels of wellness support from their organizations were more than twice as likely to have better health than nurses who reported not having supportive worksites. This result was also found in a previous national study.[2] Even nurses who reported their workplaces as only somewhat supportive of wellness had higher odds of better health and professional quality of life.

Although it has been reported that the safest and most efficient means of improving patient safety in critical care is to improve the safety of the medication process,[31] improving the overall well-being of clinicians has begun to be emphasized in the patient safety literature. However, the literature generally focuses on the health of physicians, rather than nurses, and does not specifically address critical care units.[20] To improve quality and safety, organizations must invest in resources and support that enhance nurses' and other clinicians' overall well-being. Although employers usually understand that health and engagement of clinicians translate into higher levels of productivity, less absenteeism, and lower health care costs owing to less turnover,[2] investment in the overall well-being of clinicians is often not given high priority.

A survey conducted by the American Hospital Association indicated that 90% of hospitals implement employee wellness programs; however, the comprehensiveness of these programs varies greatly.[32] More chief wellness officers have been hired in the past few years following an urgent call to action by the NAM's Action Collaborative on Clinician Well-being.[33] However, most hospitals in the United States still do not invest in the chief wellness officer role or provide the resources to build comprehensive wellness cultures. Evidence-based interventions known

> CCNs who perceived high levels of wellness support from their organizations were twice as likely to have better health.

to be effective need to be rapidly translated into clinical settings in order to improve outcomes for nurses and other clinicians. A systematic review of 29 randomized controlled trials that tested interventions designed to improve physician and nurse mental and physical health, well-being, and lifestyle behaviors indicated that mindfulness, cognitive-behavioral therapy–based programs, gratitude practices, and deep breathing are effective in reducing depression, anxiety, and stress.[34] For increasing physical activity, the same study found that visual triggers, pedometers, and health coaching with texting were effective.

Findings from a recent randomized controlled trial with new nurse residents indicated that provision of a manualized cognitive-behavioral skills building program consisting of 8 weekly sessions (entitled MINDBODYSTRONG) resulted in less depression, anxiety, and stress as well as higher job satisfaction.[35,36] These positive outcomes lasted up to 6 months after completion of the program.

Well-being support options also exist for nurses without workplace support. The NAM and the American Nurses Association provide free wellness resources via their Action Collaborative on Clinician Well-being[1] and Well-Being Initiative.[37] The urgent call to action for nurse well-being does not apply solely to industry leaders; of equal importance is nurses' need to prioritize their own self-care. Challenges to self-care do exist and can feel overwhelming[38]; however, a good starting place is engaging in the practice of mindfulness, that is, being present in the current moment and becoming aware of how one responds to a situation without applying judgment to it.[39] Self-care also includes seeking professional help when functioning becomes challenging. When seeking professional help, finding a therapist who practices cognitive-behavioral therapy is recommended, as this type of treatment is considered the criterion standard for anxiety and depression.[40,41]

The major implication of this study's findings for hospital leaders and policy makers is that CCNs whose well-being is supported by their organizations are more likely to be fully engaged in patient care and make fewer medical errors, resulting in better patient outcomes and more lives saved. It is also important to note that this study was conducted before the COVID-19 outbreak in the United States. Therefore, current levels of depression, anxiety, and stress in CCNs are likely to be higher than indicated by our study results. Critical care nurses' ability to provide optimal care during these extraordinary times is linked to hospitals' ability to build and sustain wellness cultures and provide solutions to long-standing systemic problems that contribute to burnout, stress, and

depression, such as short staffing, electronic health record issues, and 12-hour shifts.[42]

Limitations

The first limitation of this study is the cross-sectional design. Although findings showed that CCNs with worse self-reported health had a higher likelihood of reporting medical errors compared with nurses with better health, causality cannot be inferred. Additionally, the type of medical error was not measured; thus the seriousness of the error is unknown. Another limitation is recall bias, as the study relied on self-reporting for medical errors. However, self-reporting is a common approach to assessing medical errors and has been used in previous studies.[43] Some researchers have recommended using objective measures of medical errors[44]; however, these may not be accurate owing to clinician underreporting influenced by concerns about negative consequences.[45,46] Use of an anonymous survey removed some of these concerns. The final limitation is that only CCNs were studied, so the results cannot be generalized to the entire US nurse population.

Sensitivity analyses showed similar associations of health with medical errors and workplace wellness support, suggesting that our study findings were robust. Another study strength was the simple random sampling used, which increases the external validity of the study. Our sample's demographics (sex, race, age, and level of education) were similar to those found in the 2018 AACN nurse work environment survey.[47]

Conclusion

This study addresses a gap in the literature by providing evidence that CCNs' perception of worksite wellness support is related to their physical and mental health as well as the number of preventable medical errors made. Health care leaders must prioritize the overall well-being of their nurses and other clinicians by fixing system issues known to cause burnout (eg, long shifts, poor staffing ratios), creating wellness cultures, and providing evidence-based wellness programming, which will ultimately optimize health care quality and patient safety.

SEE ALSO

For more about critical care nurses' work environments, visit the *Critical Care Nurse* website, **www.ccnonline.org**, and read the article by Ulrich et al, "Critical Care Nurse Work Environments 2018: Findings and Implications" (April 2019).

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CE 1.0 Hour Category A

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

1. Identify the relationships among critical care nurses' health, perceived wellness support, and medical errors.
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3. Discuss evidence-based interventions that are effective in reducing nurses' depression, anxiety, and stress.

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