Received: 7 April 2023 | Revised: 23 August 2023 | Accepted: 31 August 2023

DOI: 10.1002/emp2.13040

JACEP OPEN
JOURNAL OF THE AMERICAN COLLEGE OF EMERGENCY PHYSICIANS OPEN
A GLOBAL JOURNAL OF EMERGENCY MEDICINE
WILEY

ORIGINAL RESEARCH

The Practice of Emergency Medicine

The association of the emergency department work environment on patient care and nurse job outcomes

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Funding and support: By *JACEP Open* policy, all authors are required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this article as per ICMJE conflict of interest guidelines (see www.icmje.org). The authors have stated that no such relationships exist.

Abstract

Objective: To determine the association between emergency nurses' work environments and patient care quality and safety, and nurse burnout, intent to leave, and job dissatisfaction.

Methods: Cross-sectional study of 221 hospitals in New York and Illinois informed by surveys from 746 emergency nurses and 6932 inpatient nurses with linked data on hospital characteristics from American Hospital Association Annual Hospital Survey. The RN4CAST-NY/IL study surveyed all registered nurses in New York and Illinois between April and June 2021 about patient safety, care quality, burnout, intent to leave, and job dissatisfaction and aggregated their responses to specific hospitals where they practiced. Work environment quality was measured using the abbreviated Practice Environment Scale of the Nursing Work Index. Generalized estimating equations were used to determine the relationship between emergency nurses' work environments on patient care and nurse job outcomes.

Results: A total of 58% of emergency nurses reported high burnout, 39% reported job dissatisfaction, and 27% indicated intent to leave their job in the next year. Nurses in hospitals with good (vs mixed) or mixed (vs poor) emergency work environments were less likely to report unfavorable patient care quality and hospital safety grades, and were less likely to experience high burnout, job dissatisfaction, and intentions to leave the job, by factors ranging from odds ratio (OR) 0.21 (95% confidence interval [CI], 0.16–0.29) to OR 0.46 (95% CI, 0.34–0.61).

Conclusions: Given the complex and high stakes nature of emergency nursing care, leaders should place a high priority on organizational solutions targeting improved nurse staffing and work environments to advance better patient and clinician outcomes.

KEYWORDS
burnout, emergency department, nurse, turnover, work environment

Supervising Editor: Brittany Punches, PhD, RN.

1 | INTRODUCTION

1.1 | Background

The emergency department (ED) work environment is a unique organizational setting marked by uncertainty—patients present at all hours with a range of health conditions and acuity levels, often requiring intensive nursing care coordinated within a multidisciplinary team.[1] Nurses deliver the majority of direct patient care across various hospital settings, including EDs, and their assessments of the work environment have been leveraged to influence work environment and policy reforms for better patient care and clinician workforce outcomes.[2,3] Emergency care is inherently interprofessional, and as clinicians providing around-the-clock care to patients, the work environment shapes the context of care for ED physicians, nurse practitioners, and other emergency health care professionals.[4] A recent study[5] found that emergency nurses report higher burnout, job dissatisfaction, and intent to leave the job compared to inpatient nurses working in the same hospitals. Although there is substantial literature on medical-surgical,[6] ICU,[7-9] and nursing home work environments,[10,11] very little is known about the emergency work environment and associated impacts to patients and clinicians.

The National Academy of Medicine,[12,13] the American College of Emergency Physicians,[14] and the Emergency Nurses Association,[15] among other national organizations, emphasize the need to cultivate safer EDs for both patients and clinicians using evidence-based practices. To-date, solutions to improve ED work environments focus on workplace violence interventions (eg, increased security personnel and metal detectors), the organization of critical care through modified ICUs in EDs,[16] and taking registered nurses from the bedside to oversee higher numbers of lower-skilled nurses ("team nursing").[17] Absent in the emergency medicine literature, however, is baseline, foundational evidence on the quality of ED work environments.

1.2 | Importance

ED work environments are understudied, despite the distinct characteristics of these settings as highly unpredictable and accomodating of high patient volumes across the continuum of acute to chronic illnesses. Mounting operational pressures in EDs such as crowding, violence toward staff and uncooperative patients and visitors, hospital diversion, and heightened clinician workloads necessitates research on ED work environments for the development of targeted health care policies that improve patient care delivery and clinician outcomes from well-being and job retention perspectives.[18-21]

1.3 | Goals of This Investigation

Contemporary evidence[22] on clinician well-being during the COVID-19 pandemic demonstrates that over half of nurses and one-third of physicians in US hospitals report high burnout, with approximately 20%–40% of clinicians reporting an intent to leave their job in the next year. Over 30 years, health services research has found that supportive work environments, which include safer nurse staffing levels and stronger collegial nurse–physician partnerships, are associated with lower odds of nurse outcomes (ie, burnout, intent to leave, and job dissatisfaction), and patient outcomes like mortality[23–27] and hospital readmissions.[28–31] It is also well-established that patients in hospitals with lower proportions of nurses with high burnout, job dissatisfaction, and intentions to leave experience shorter lengths of stays and fewer health care-associated infections.[7,32,33]

Little is known about the quality of ED work environments across hospitals, thus hindering efforts to cultivate safer EDs for the provision of high-quality patient care, and for the well-being and retention of the ED workforce. Thus, the objective of this study is to evaluate the relationship between the ED clinical work environment and patient care and nurse job outcomes. Our proposed hypothesis was that nurses working in hospitals with better ED work environments would experience lower odds of poor job outcomes (eg, burnout, intent to leave, and job dissatisfaction) and higher odds of reporting high quality of care and patient safety compared to EDs with mixed or poor work environments.

The Bottom Line

Nurses deliver the majority of direct patient care in emergency departments. Working in a better work environment characterized by adequate staffing resources, strong interprofessional collaboration, and supportive leadership valuing nursing was associated with lower odds of nurses reporting poor patient care quality and safety, as well as lower burnout, job dissatisfaction, and intent to leave the job.

2 | METHODS

2.1 | Study design/setting

This study used a cross-sectional research design and linked survey data from 2 sources: the 2021 RN4CAST-NY/IL[2] and the American Hospital Association (AHA) Annual Hospital Survey.[6,34] The RN4CAST-NY/IL nurse survey included data on the nurse-reported work environment, patient outcomes, and nurse job outcomes (eg, burnout). . The AHA Annual Survey[34] provided information on hospitals' technology capabilities, teaching status, bed size, ED volume, and trauma center designation.

The nurse survey data were collected between April and June 2021 from direct-care nurses in New York and Illinois. Surveys were sent via email to all registered nurses in New York and Illinois. Nonrespondents received follow-up reminder emails at regular intervals over a 2-month period using the Dillman method.[35] The survey took

10–15 minutes for participants to complete. The RN4CAST-NY/IL study methodology has been described in detail elsewhere.[6]

Nurses reported on their personal characteristics and those of their employer (hospital), aspects of patient care (care quality and safety), and job outcomes (ie, burnout, intent to leave, and job dissatisfaction).[2] The use of front-line nurses as informants about their work environments and patient outcomes has been previously validated in studies comparing nurse reports to independent sources of patient data.[36] Nurse survey responses on the organizational work environment in this study are aggregated to the hospital level.[35,37] This method is preferred over approaching hospitals to access nurses, which would potentially produce meaningful non-response bias given that poorly resourced hospitals or those with worse outcomes may be less likely to participate. A double-sampling approach (non-response bias gold standard) used on prior RN4CAST surveys found no significant differences in nurse-reported measures between main survey respondents and non-responders.[35] In other words, non-responders did not report any more or less critically about their work environments in comparison to main respondents in previous studies. The University of Pennsylvania institutional review board approved the protocol for this study.

2.2 | Selection of subjects

We included all acute care hospitals in New York and Illinois with nurse respondents and included EDs that were free-standing or population specific (ie, pediatric EDs). Direct care nurse reports on their work environment and study outcomes were derived from the RN4CAST-NY/IL survey and aggregated to the hospital level. Two samples were included in the regression analyses: an ED-only nurse sample, and an all-nurse sample with ED and inpatient nurses included in 221 hospitals.

2.2.1 | Justification of nurse sample

The primary sample for the regression analyses was ED nurses and a secondary sample was ED and inpatient nurses (combined, from the same 221 study hospitals) for additional analyses. Given prior evidence that the local unit context is strongly influenced by the broader hospital context (ie, surrounding units), we constructed models using nurses from all units (ED and inpatient nurses) to contextualize study findings from models using ED nurse responses only. Hospitals that did not have a sufficient number of ED nurses to reliably estimate the work environment were excluded. According to the intraclass correlation coefficients, a minimum of 2 nurse respondents per hospital was sufficient to produce reliable estimates of the environment.[38,39]

2.3 | Measurements

2.3.1 | Exposure

The main exposure variable in this study was the work environment, measured using an abbreviated version of the National Quality Forum-endorsed measure, the Practice Environment Scale of the Nursing Work Index (PES-NWI).[40] The PES-NWI asks nurses to indicate their level of agreement on certain organizational attributes present in their jobs, specifically, (1) nurse participation in hospital affairs, (2) nursing foundations for quality care, (3) nurse manager/leadership ability, (4) staffing and resource adequacy, and (5) interprofessional collaboration.[40,41] The PES-NWI's Cronbach α ranges from 0.84 to 0.93.[40–42] The abbreviated PES-NWI uses 1 item from each subscale of the full 31-item PES-NWI to create a work environment measure based on the aforementioned qualities. Each individual nurse response to the abbreviated PES-NWI was averaged to the hospital level for each subscale, and then averaged subsequently to create a continuous work environment measure aggregated to the hospital level.[43] This continuous PES-NWI score was then categorized to contrast the top quartile of hospitals, defined as having good work environments, with the bottom quartile, defined as having poor work environments, and with the middle 2 quartiles, which were combined and defined as having mixed work environments [7,43]

2.3.2 | Outcomes

Our outcome variables were nurse-reported quality of patient care, patient safety, and nurse job outcomes including burnout, job dissatisfaction, and intent to leave. The quality of patient care in the ED was assessed by nurses using a 4-point scale from "excellent" to "poor" to answer the question, "how would you describe the quality of nursing care delivered to patients in your practice setting?". Quality was considered "poor" if nurse responses were "fair" or "poor"; quality was considered "good" if nurse responses were "good" or "excellent." Patient safety was assessed using the AHRQ Patient Survey on Patient Safety Culture items,[44] where nurses rated how well their practice setting delivered safe patient care and prevented infections on a scale from A to F (favorable to unfavorable). Unfavorable safety grades were considered grades C, D, or F (vs "A or B" grades).[45] These measures have excellent predictive validity for direct measures of patient outcomes including mortality, patient satisfaction, and process of care indicators.[36,46]

Burnout, job dissatisfaction, and intent to leave were derived from the nurse survey. Burnout was measured using the Maslach Burnout Inventory[45,47,48] emotional exhaustion subscale with a score greater than 27 classified as high burnout. Job dissatisfaction was measured by nurses' response to the question, "Overall, how satisfied are you with your job?". Last, intent to leave was a binary variable and was measured by nurse responses to the question, "Do you plan to be with your current employer 1 year from now?".

2.3.3 | Covariates

Hospital-level covariates from the AHA Annual Hospital Survey[34] included teaching status (non-teaching: no residents/fellows; minor teaching: <1 fellow/resident per 4 beds; major teaching: ≥1 fellow/resident to 4 beds), technology capabilities (high technology can

perform open-heart surgery or major organ transplantation), bed size category (≤100 beds, 101–250 beds, 251–500 beds, >500 beds), trauma designation, and annual ED patient volume (0–20,000 visits to >100,000 visits). Individual nurse level covariates included age, sex, education level, and years of experience.

2.4 | Analysis

Descriptive statistics were used to describe characteristics of the nurses and their reports on patient and nurse job outcomes. Outcome variables were dichotomized to represent good/poor care quality, safety (grade "A or B" or "C, D, F"), and nurse job burnout, satisfaction, and intent to leave. We show the percentages of nurses reporting unfavorable outcomes (eg, poor quality care, poor patient safety grade, and high nurse burnout, job dissatisfaction, and intent to leave). We also describe how work environments differ in hospitals with various characteristics (eg, bed size, technology, and teaching status, etc), and use χ^2 tests to determine the significance of the differences.

Multilevel loglinear models with generalized estimating equations were used to examine the association of the 3-category ordered ED work environment (PES-NWI) variable on 2 different patient outcomes (ie, quality of patient care and patient safety) and 3 nurse job outcomes (ie, nurse burnout, job dissatisfaction, and intent to leave). We first estimated unadjusted models, or bivariate models that showed the relationship between work environments and the outcomes absent any controls, and then estimated adjusted, multivariable models that controlled for characteristics of the nurses and the hospitals. This approach takes into account the within group (in this case hospital) correlation as a nuisance parameter.

As described above (Justification of Nurse Sample), we sought to evaluate the relationship between the work environment and study outcomes among emergency nurses, and separately, contextualized by an all-nurse study sample. The rationale was based on evidence that the local unit context is influenced by the larger hospital work environment.[49,50] Therefore, we first examined the association of emergency nurse work environment reports and ED outcomes (Panel A). Second, we examined all-nurse (ie, ED and non-ED nurse) work environment reports on ED nurse study outcomes (Panel B). Finally, we evaluated all-nurse work environment reports on the study outcomes of all nurses (Panel C). All of these associations were constrained to be linear, which means that the difference between nurses in hospitals in the best work environment category versus the middle category was the same as the difference between nurses in the middle work environment category versus nurses in the lowest category. StataIC 17 was used for data analyses.

2.5 | Sensitivity analyses

Sensitivity analyses were conducted to evaluate the robustness of our findings under different model specifications. The first model, outlined in our Table 3 findings, employs the aforementioned linear constraint and thus uses a single odds ratio (OR) to describe the association of the work environment with the various outcomes. The second model, shown in Supporting Information Appendix S1 alongside the linear constraint models, uses 2 ORs to allow the 3 categories of the work environment exposure variable to be non-linearly related to the outcomes. We found that the associations of the work environment with the study outcomes were, in most cases, adequately described by the single OR in the linear model. Models where the linear constraint was inappropriate are indicated in Supporting Information Appendix S1.

3 | RESULTS

Table 1 displays characteristics of the overall sample of hospital nurses in this study, which included an overall sample of 7678 nurses, 746 of which were emergency nurses, in 221 hospitals. The ED and inpatient nurse samples were similar with respect to age (42 vs 43 years, respectively, $P = 0.06$), and experience (13 vs 15 years, $P < 0.001$), whereas ED nurses were less likely than inpatient nurses to be female (82% vs 90%, $P < 0.001$) and to have a baccalaureate degree or higher (77% vs 78%, $P = 0.05$).

Although emergency nurses reported higher burnout (58% vs 51%, $p < 0.001$) and job dissatisfaction (39% vs 31%, $P < 0.001$) than inpatient nurses, the 2 groups were similar with respect to their turnover intentions (24% overall, 27% ED, $P = 0.05$). Approximately one-third of ED nurses versus one-fourth of the inpatient nurses reported poor patient care quality in their health care setting, and more ED nurses than inpatient nurses (59% vs 45%, $P < 0.001$) gave their hospital safety culture a rating of "C, D, or F" (46% overall).

Table 2 shows the characteristics of hospitals with poor (bottom quartile), mixed (middle 2 quartiles), and good (top quartile) work environments (as rated by the PES-NWI). Hospitals with good ED work environments were significantly more likely than other hospitals to be non-teaching hospitals and to have ED patient volume of less than 40,000 annually. Figure 1 displays ED patient care quality and safety and nurse job outcomes in hospitals with poor, mixed, and good work environments.

The results of the logistic regression analyses are displayed in Panels A, B, and C of Table 3. The ORs in Panel A provide estimates of the association of the work environment with patient and nurse outcomes, when both the environment and outcomes are derived solely from ED nurse reports. The ORs in Panel B estimate the same associations except using reports on the work environment from all nurses in hospitals (ie, inpatient and ED nurses). These ORs in Table 3 indicate how much the odds of hospital nurses reporting poor nurse and patient outcomes when nurses in hospitals with mixed environments are compared to nurses in hospitals with poor environments, and when nurses in hospitals with good environments are compared to nurses in hospitals with mixed environments. Panel C estimates the same association between the work environment as reported by all nurses on outcomes for all nurses, including non-ED nurses.

These ORs, using Panel A as an example, estimate how the odds on the various outcomes differ when nurses in mixed versus poor

TABLE 1 Characteristics of the nurse sample

Characteristic	All nurses (n = 7678)	ED nurses (n = 746)	Inpatient nurses (n = 6932)	*P* value
Demographics				
Age (years), mean (SD)	42.9 (13)	42.0 (12)	42.9 (13)	0.06
Female, No. (%)	6863 (89)	613 (82)	6250 (90)	<0.001
BSN or higher, No. (%)	5972 (78)	574 (77)	5398 (78)	0.05
Experience years, mean (SD)	14.4 (13)	12.8 (0.4)	14.5 (0.2)	<0.001
Nurse-reported job outcomes				
High burnout, No. (%)	3917 (52)	429 (58)	3488 (51)	<0.001
Job dissatisfaction, No. (%)	2437 (32)	290 (39)	2147 (31)	<0.001
Intent to leave job, No. (%)	1854 (24)	202 (27)	1652 (24)	0.05
Nurse-reported patient outcomes				
Poor care quality, No. (%)	1906 (25)	256 (34)	1650 (24)	<0.001
Safety grade of C, D, or F, No. (%)	3540 (46)	442 (59)	3098 (45)	<0.001

Abbreviation: BSN, Bachelor of Science in Nursing.

TABLE 2 Characteristics of hospitals, by ED work environment

Hospital characteristic	Overall *n* = 221	ED work environment			*P* value
		Poor *n* = 55	Mixed *n* = 111	Good *n* = 55	
Bed size, No. (%)					0.64
Small	99 (45)	22 (40)	48 (44)	29 (53)	
Medium	87 (39)	22 (40)	46 (41)	19 (34)	
Large	35 (16)	11 (20)	17 (15)	7 (13)	
Technology status, No. (%)					0.46
High tech	92 (42)	19 (35)	49 (44)	24 (44)	
Non-high tech	129 (58)	36 (65)	62 (56)	31 (56)	
Teaching status, No. (%)					0.01
Major	76 (34)	20 (36)	44 (39)	12 (22)	
Minor	66 (30)	19 (35)	35 (32)	12 (22)	
None	79 (36)	16 (29)	32 (29)	31 (56)	
Trauma center, No. (%)					0.39
Yes	113 (51)	28 (51)	61 (55)	24 (44)	
No	108 (49)	27 (49)	50 (45)	31 (56)	
ED patient volume, No. (%)					0.01
0–20,000	32 (15)	4 (7)	12 (11)	16 (29)	
20–40,000	53 (24)	12 (22)	26 (23)	15 (27)	
40–60,000	43 (19)	16 (29)	18 (16)	9 (16)	
60–80,000	29 (13)	4 (7)	22 (20)	3 (5)	
80–100,000	20 (9)	5 (9)	10 (9)	5 (9)	
>100,000	44 (19)	14 (25)	23 (21)	7 (13)	

Note: Work environments were scored for each hospital by adding up and averaging individual nurse scores on the abbreviated PES-NWI. The resulting hospital score was then used to categorize hospitals according to whether they were "Poor" (or in the lowest quartile), "Mixed" (in the middle 2 quartiles), or "Good" (in the top quartile).

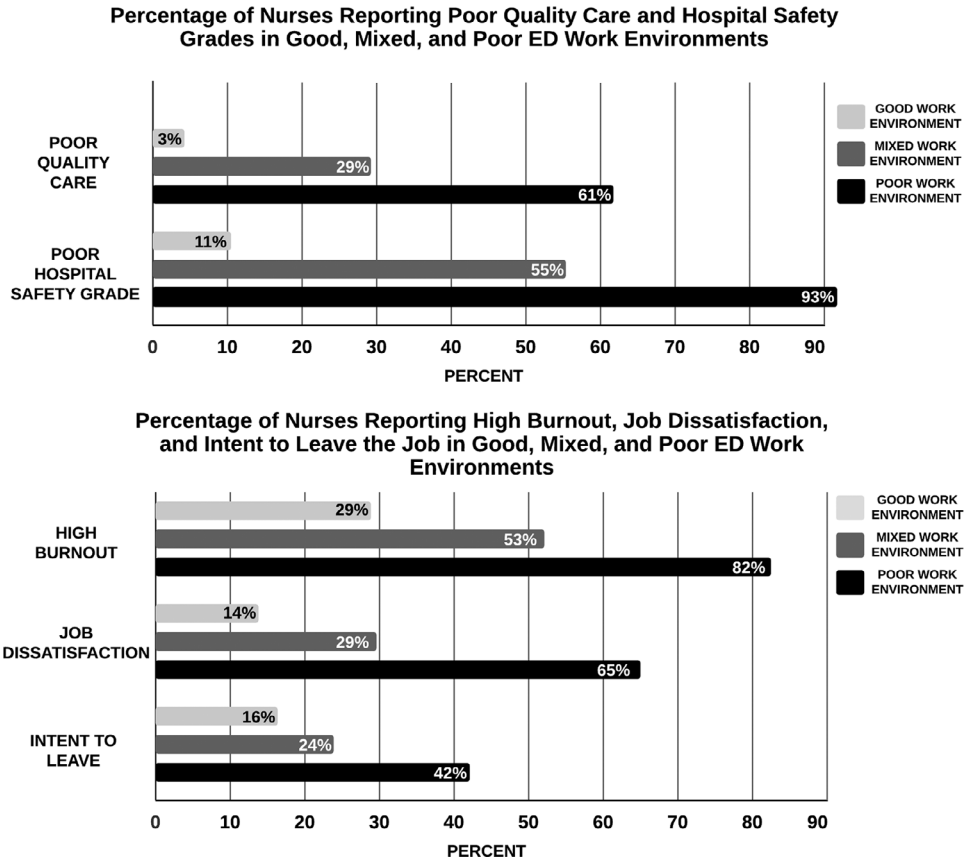

FIGURE 1 Emergency department nurse-reported patient care and nurse job outcomes.

environments and good versus mixed environments are compared. After adjusting for nurse and hospital characteristics, and because we imposed a linear constraint on the difference between the 3 categories of hospitals, nurses in hospitals with mixed environments are less likely than those in hospitals with poor environments, and nurses in hospitals with good ED work environments are less likely than those in hospitals with mixed environments, to report poor quality patient care and poor patient safety, by OR factors of 0.35 (95% CI, 0.27–0.46, $P < 0.001$) and 0.21 (95% CI, 0.16–0.29, $P < 0.001$), respectively, or by 65% and 79%. The linearity in these ORs implies that the differences in the odds of reporting poor quality care and poor patient safety between nurses in hospitals with good versus poor environments are by factors of $0.35^2 = 0.12$ and $0.21^2 = 0.04$ or by 88% and 96%, respectively.

Similar relationships were demonstrated in modeling the ED work environment on ED nurse-reported job outcomes (also in Panel A). In adjusted models, a change in the ED work environment from poor to mixed (or mixed to good) was associated with 61% lower odds of nurse-reported burnout (OR, 0.39; 95% CI, 0.31–0.49, $P < 0.001$), 67% lower odds of job dissatisfaction (OR, 0.33; 95% CI, 0.26–0.43, $P < 0.001$), and a 54% lower odds of nurse intent to leave their employer in the next year (OR, 0.46; 95% CI, 0.34–0.61, $P < 0.001$). These relationships were also significant when the environment was estimated by all nurses, and not just ED nurses (in Panel B), and when outcomes were estimated for all nurses, and not just ED nurses (in Panel C). The similarities between the unadjusted and adjusted ORs in the 3 panels of Table 3 indicate that adjustment for nurse and other hospital characteristics has little effect on the estimated environment–outcomes associations, whereas the similarities between the ORs in the 2 panels indicates that it makes little difference whether the environment is estimated by all nurses on all units or by ED nurses only.

4 | LIMITATIONS

Our indicators of patient quality and safety are derived from nurse reports rather than from the patients themselves. Previous studies, however, have validated that nursing reports on patient quality and safety closely align with objective patient outcome data when compared empirically.[36] The study design was observational using cross-sectional data, thus limiting our ability to infer causality.

5 | DISCUSSION

Our findings suggest that ED work environments vary across hospitals, and that the emergency work environment is associated with care outcomes (ie, quality and safety) and nurse job outcomes

TABLE 3 Unadjusted and adjusted ORs estimating the effect of the hospital work environment on nurse-reported patient outcomes and nurse job outcomes, measured using ED nurses only and all (ED and inpatient) nurses

Panel A: work environment and outcomes from ED nurses in hospitals with ED units	**Unadjusted OR (95% CI)**	**Fully adjusted OR (95% CI)**
Patient outcomes		
Care quality	0.35 (0.27, 0.45)*	0.35 (0.27, 0.46)*
Safety	0.21 (0.16, 0.28)*	0.21 (0.16,0.29)*
Nurse outcomes		
Burnout	0.41 (0.33, 0.53)*	0.39 (0.31,0.49)*
Job dissatisfaction	0.32 (0.26, 0.42)*	0.33 (0.26,0.43)*
Intent to leave	0.51 (0.39, 0.68)*	0.46 (0.34,0.61)*
Panel B: work environment from all nurses and outcomes from ED nurses		
Patient outcomes		
Care quality	0.41 (0.30, 0.54)*	0.42 (0.31,0.57)*
Safety	0.26 (0.19, 0.36)*	0.28 (0.20,0.40)*
Nurse outcomes		
Burnout	0.51 (0.40, 0.66)*	0.48 (0.37,0.63)*
Job dissatisfaction	0.42 (0.32, 0.56)*	0.42 (0.32,0.55)*
Intent to leave	0.55 (0.41, 0.73)*	0.51(0.38,0.69)**
Panel C: work environment and outcomes from all nurses in all hospitals		
Patient outcomes		
Care quality	0.36 (0.31, 0.42)[a]*	0.35 (0.31,0.41)[a]*
Safety	0.34 (0.30, 0.39)[a]*	0.33 (0.29, 0.38)[a]*
Nurse outcomes		
Burnout	0.57 (0.52, 0.62)*	0.55 (0.49, 0.60)*
Job dissatisfaction	0.48 (0.44, 0.53)*	0.46 (0.42, 0.51)*
Intent to leave	0.64 (0.57, 0.71)*	0.61 (0.54, 0.68)*

Notes: Outcomes data were derived from 746 nurse in Panels A and B and 7678 nurse responses in Panel C in 221 hospitals. Hospital characteristics include bed size, teaching status, technology status, ED patient volume, and trauma designation. Nurse characteristics include age, sex, education level, and experience years. ORs are from generalized estimating equations and indicate how much less likely the odds on poor care quality and safety are for patients, and how much less likely the odds on burnout, dissatisfaction, and intent to leave are for nurses, in hospitals (or ED units) with "Good" versus "Mixed" work environments and in "Mixed" versus "Poor" work environments.

Abbreviations: ED, emergency department; CI, confidence interval; OR, odds ratio.

*Indicates significance at $p \leq 0.001$.

**Indicates significance at $p \leq 0.01$.

[a]Indicates models that deviated from the linear constraint implied by the single OR; see the Sensitivity Analysis in Supporting Information Appendix S1.

(ie, burnout, job satisfaction, and intent to leave). Our principal finding was that hospitals with better ED work environments have better outcomes.

Study results demonstrate that nurses working in mixed ED work environments compared to poor ED work environments (and good compared to mixed environments) had lower odds of reporting poor quality patient care and poor patient safety by 65% and 79%. Similar relationships were observed in models evaluating the work environment on nurse job outcomes, wherein a change in the ED work environment from poor to mixed (or mixed to good), was associated with reduced odds of reporting burnout, job dissatisfaction, and intent to leave by 61%, 67%, and 54%, respectively.

This study advances emergency medicine research in the context of the ongoing COVID-19 pandemic that continues to place disproportionate burdens on EDs and in turn impact clinician well-being and turnover intentions. In a cross-sectional national survey of US nurses, Castner and Bell (2021)[51] identified that over half of emergency nurses who remained in their current position between 2016 and 2017 still contemplated leaving their employer. They also identified that the largest population of nurses entering emergency nursing are newly licensed.[51] Given the high costs of clinician job turnover,[52,53] there is a crucial need to improve work environments for patient care delivery and the retention of new emergency clinicians.

The variation in the ED work environment across hospitals is important for the larger clinician team, given that ED nurses operate closely with physician and otherclinicians.[54] Our findings on the association between the ED work environments and nurse burnout supplement established evidence on the emergency physician work experience. In a cross-sectional study of emergency physicians, Watson and colleagues[55] identified associations between physician workload, burnout, and poor patient quality care reports, such as impersonal care and inadequate time to provide patient/family education). Given the findings from our study on nurses and the aforementioned physician research, future studies are needed evaluating how burnout in one clinician group can impact another indirectly, as well as patient outcomes. Future studies must also examine how variations in nurse staffing impact ED patient care, and ultimately can be modified to improve patient and clinician outcomes.

Our findings support that the ED work environment is associated with ED patient care quality, safety, and clinician job outcomes as reported by nurses. Health care leaders should consider nurse work environment such as safe staffing policies that ensure adequate resources for EDs to accommodate fluctuations in patient volumes and high-acuity care.

AUTHOR CONTRIBUTIONS

K. Jane Muir, Matthew D. McHugh, and Douglas M. Sloane conceived the study. Matthew D. McHugh obtained research funding. K. Jane Muir and Matthew D. McHugh conducted data analysis. Linda H. Aiken, Matthew D. McHugh, Douglas M. Sloane, and Vaneh Hovsepian

provided significant statistical advice and oversight on manuscript development and revisions. K. Jane Muir and Vaneh Hovsepian drafted the manuscript. All authors contributed substantially to the manuscript revision.

ACKNOWLEDGMENTS

This research was funded by the National Institute of Nursing Research (T32 NR007104 and R01 NR014855 to MDM and LHA) and the National Council of State Boards of Nursing (to KBL).

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Muir KJ, Sloane DM, Aiken LH, Hovsepian V, McHugh MD. The association of the emergency department work environment on patient care and nurse job outcomes. *JACEP Open*. 2023;4:e13040. https://doi.org/10.1002/emp2.13040

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