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Organization of Nursing and Quality of Care for Veterans at the End of Life

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Abstract

Context—The Veterans Health Administration (VA) has improved the quality of end-of-life (EOL) care over the past several years. Several structural and process variables are associated with better outcomes. Little is known, however, about the relationship between the organization of nursing care and EOL outcomes.

Objectives—To examine the association between the organization of nursing care, including the nurse work environment and nurse staffing levels, and quality of EOL care in VA acute care facilities.

Methods—Secondary analysis of linked data from the Bereaved Family Survey (BFS), electronic medical record, administrative data, and the VA Nursing Outcomes Database. The sample included 4908 veterans who died in one of 116 VA acute care facilities nationally between October 2010 and September 2011. Unadjusted and adjusted generalized estimating equations were used to examine associations between nursing and BFS outcomes.

Results—BFS respondents were 17% more likely to give an excellent overall rating of the quality of EOL care received by the veteran in facilities with better nurse work environments ($P \leq 0.05$). The nurse work environment also was a significant predictor of providers listening to concerns and providing desired treatments. Nurse staffing was significantly associated with an excellent overall rating, alerting of the family before death, attention to personal care needs, and the provision of emotional support after the patient's death.

Conclusion—Improvement of the nurse work environment and nurse staffing in VA acute care facilities may result in enhanced quality of care received by hospitalized veterans at the EOL.

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Disclosures

The authors declare no conflicts of interest.

Keywords

Nursing care; palliative care; veterans; quality of care; end-of-life care; Department of Veterans Affairs

Introduction

In 1997, the Institute of Medicine released a seminal report calling for the improvement of care at the end of life (EOL).[1] The Veterans Health Administration (VA)—the largest integrated health system in the world—responded to the Institute of Medicine recommendations and embarked on a coordinated plan to increase access to EOL services through the installation of palliative care consultation teams and specialized hospice/palliative care units, as well as the provision of interprofessional training. Systematic evaluation of these enhancements has demonstrated a consistent annual increase in families' overall ratings of EOL care in VA facilities and significant associations among several palliative care practices and higher ratings of care.[2–7] However, the identification of broader organizational structures and processes that can enhance EOL care is also an important step in quality improvement efforts.

Previous research indicates that the organization of nursing care, including the work environment and nurse staffing levels, is associated with patient outcomes,[8,9] including satisfaction with care—an increasingly important outcome and performance measure. In non-VA acute care settings, higher nurse-to-patient ratios and work environments that better support nurses in their practice have been associated with higher scores on the Hospital Consumer Assessment of Healthcare and Providers Survey, which captures patients' evaluations of care.[10–12] However, no studies have examined the association between nursing-related factors and satisfaction with EOL care, where quality typically is evaluated by bereaved family members rather than patients.[4,13–16] The VA has used the Bereaved Family Survey (BFS), an instrument endorsed by the National Quality Forum (NQF), for this purpose since 2008.

The purpose of this nationwide study of VA acute care facilities was to explore the relationship between the nurse work environment, registered nurse (RN) staffing levels, and family perceptions of the care received by veterans at the EOL. The Integrated Framework for a Systems Approach to Nurse Staffing Research[17] was used to conceptually guide the study. This framework includes Donabedian's structure-process-outcome model,[18] with an overlay of four additional factors (patient, nurse, unit, and system) and was used to guide the selection of study variables.

Methods

Data Sources and Procedures

This study was a secondary analysis of linked cross-sectional data from the BFS, electronic medical records, administrative data, and the VA Nursing Outcomes Database (VANOD) for VA acute care facilities in fiscal year (FY) 2011 (October 2010–September 2011).

BFS data were collected as part of a national VA quality improvement program called PROMISE (Performance Reporting and Outcomes Measurement to Improve the Standard of Care at End-of-life). The BFS provides data about family perceptions of quality of care received by veterans who died in VA facilities. The BFS was derived from the Family Assessment of Treatment at End-of-Life (FATE)-Short Form[13] and has demonstrated strong psychometric properties.[6,13,19] Four weeks after the veteran's death, trained staff placed a phone call to the next of kin to obtain informed consent and administer the BFS. PROMISE staff also reviewed the veteran's chart to collect demographic data and information about EOL-related processes of care, such as receipt of a palliative care consult. A detailed description of data collection procedures is available on the PROMISE Center Web site (http://www.cherp.research.va.gov/PROMISE/PROMISE_Methods.asp).

Of 19,921 eligible deaths in FY 2011, BFS responses were obtained for 11,888 deceased veterans representing 145 VA acute care facilities (60% response rate). A study to evaluate the effect of nonresponse on the validity of the BFS suggested that the effect of nonresponse bias was minimal.[20] For the present study, we limited our sample to veterans who died in a medical-surgical unit or intensive care unit (ICU). About half (48%) of BFS responses in FY 2011 met these criteria. Further inclusion criteria were that the patient was cared for in only one VA facility during the last month of life, and complete nursing and administrative data were available for the facility.

The VANOD was used to access work environment, nurse staffing, and structural facility variables. The VA-NOD is a data repository that includes measures of the nurse work environment obtained from the RN Satisfaction Survey (51% response rate in FY 2011) and nurse staffing data from the VA Decision Support System. For our purposes, we included environment and staffing measures derived only from nurses working in direct patient care.

Data sets were merged using a unique facility identification number. The final sample included 4908 veterans who died in one of 116 VA acute care facilities nationally in FY 2011. All BFS and chart review data were deidentified by PROMISE Center staff and saved in a secure folder on a VA server before access by the researchers. The study was approved by the Institutional Review Boards of the Philadelphia VA Medical Center and the VA Boston Healthcare System.

Study Variables

BFS Outcomes—Our primary outcome of interest was a global item on the BFS that asked respondents to rate the overall care received by the veteran in the last month of life, using a five-point Likert scale ranging from poor to excellent. Consistent with past BFS studies, the outcome was dichotomized as excellent vs. all other responses.[2,5,7] BFS respondents also were asked to apply a four-point Likert scale of "always," "usually," "sometimes," or "never" to a set of 11 items related to specific aspects of care at the EOL, such as provision of requested treatment, and pain management. Responses for these items were dichotomized for the analysis as "always" vs. "usually/sometimes/never."[2,5,7]

Patient Characteristics—Data collected included patient age (in decades), race (white/nonwhite/unknown), gender, the presence/absence of a set of 10 medical conditions (e.g.,

kidney disease, cancer), and relationship of the BFS respondent to the veteran (spouse/child/sibling/other). We also examined three EOL care processes, including receipt of a palliative care consult in the last month of life, days spent as an inpatient in the last month of life, and do-not-resuscitate status at the time of death. These variables were used as controls in the regression analyses to account for their potential effects on the outcomes of interest.[5,19]

Nursing Organization—The nurse work environment was measured using four of the five subscales of the National Quality Forum-endorsed Practice Environment Scale of the Nursing Work Index (PES-NWI).[21] The PES-NWI is a valid and reliable instrument used to assess the presence of a set of 31 characteristics associated with environments supportive of nursing practice.[9–12,21] Nurses indicate the degree to which each characteristic is present in their current job on a four-point Likert scale that ranges from strongly disagree to strongly agree. The subscales used in this study measure nurse evaluations of collegial nurse-physician relations (e.g., “physicians and nurses have a good working relationship”); nurse manager ability, leadership, and support of nurses (e.g., “a supervisory staff that is supportive of the nurses”); nursing foundations for quality of care (e.g., “active staff development or continuing education programs for nurses”); and nurse participation in hospital affairs (e.g., “staff nurses have the opportunity to serve on hospital and nursing committees”). We excluded the staffing and resource adequacy subscale (e.g., “enough staff to get the work done”) because of multicollinearity with our direct staffing measure. For each facility, we summed the four subscales (equally weighted) to create a composite PES-NWI score. We then created three categories based on the national distribution of facility-level scores on this composite measure and classified facilities as worse (≤25th percentile), mixed (26th–74th percentile), or better (≥75th percentile). Preliminary analysis of variance comparing these three groups on the overall EOL rating item using post hoc Scheffe tests indicated a nonlinear relationship in that the top quartile was significantly different from the others, and no significant difference was found between the mixed and worse categories. Therefore, we present our analyses comparing better with mixed/worse environments.

Nurse staffing was measured as RN direct hours per patient day (HPPD). We restricted our analysis to those nursing units in each facility where patients who died in acute care units or ICUs were likely to be cared for, including critical care, medical, surgical, and mixed medical/surgical units. Patients who died in community living centers (nursing homes), psychiatric units, and rehabilitation units were excluded. Data were cleaned for errors and outliers. For example, we excluded units reporting 0 or greater than 24 RN HPPD, except in ICUs, where greater than 24 hours of RN care was plausible.[22] The total number of RN HPPD was summed across available units and then averaged to create a facility-level nurse staffing variable.

Facility Characteristics—Three facility-level structural characteristics were included as control variables: location (rural/urban), geographic region (Northeast, South, Midwest, Mountain, and West) based on the Veteran Integrated Service Network classification system, and facility complexity level. The VA facility complexity level is an internal administrative categorization based on a weighted consideration of seven factors, including patient volume and risk, available clinical services, extent of teaching and training activities,

and amount of research involvement. Facilities were categorized as high, moderate, or low complexity. Similar characteristics have been associated with patient satisfaction in previous studies[11,23] and thus, we expected that they also could affect BFS ratings.

Statistical Analysis

Descriptive statistics were calculated for patient, nursing, and facility characteristics. We assessed the distribution of BFS outcomes by nurse work environment classification and missing data patterns. Most outcomes (10 of 12) had approximately 5% missing data, whereas two measures (pain never made him or her uncomfortable, and re-experience of combat stress never made him or her uncomfortable) had greater than 10% because of the fact that these items only included patients whose families reported that the veteran experienced pain and/or post-traumatic stress disorder symptoms. Therefore, the missing data were indicative of patients who did not have pain or post-traumatic stress disorder symptoms. To examine the relationship between nursing features and BFS outcomes, we implemented a series of unadjusted and adjusted generalized estimating equations that accounted for clustering within facilities. As our outcomes were dichotomous, we implemented the logit link in PROC GENMOD. SAS, version 9.2 (SAS Institute, Inc., Cary, NC) was used for the analysis.

Results

The sample was predominantly male (98.0%), and almost 90% were older than 60 years. Nearly one-quarter (22.7%) of the patients were nonwhite. In 46.1% of cases, the BFS was completed by a spouse. Kidney disease (53.6%) and pneumonia (44.0%) were the most common medical conditions experienced during the last month of life. More than half (54.0%) of the patients had received a palliative care consult before death, and nearly 87% had a do-not-resuscitate order. On average, veterans spent approximately 14 days as an inpatient during their last month of life (Table 1).

The distribution of patients by the structural characteristics of the treating facilities, including nursing, is displayed in Table 2. Less than half (44.0%) of the patients were treated in facilities with RN staffing levels greater than eight HPPD, which approximates a 1:3 nurse-to-patient ratio. As described previously, three nurse work environment categories were created such that 26% of the patients were cared for in better environments, 50% were in mixed environments, and 24% were in worse environments. Most patients were cared for in high-complexity facilities (84.6%) in urban areas (92.8%). About half (48.0%) of the patients died in facilities located in the southern U.S.

The frequencies of the BFS outcomes for the entire sample and stratified by quality of the nurse work environment are reported in Table 3. Less than half (48.0%) of BFS respondents rated the care the veteran received during the last month of life as excellent overall. Statistically significant differences were found among the quality of nurse work environment categories on five of the 12 BFS measures, including the global overall rating measure. Specifically, more than half (51.8%) of BFS respondents reported the receipt of overall excellent care in better nurse work environments compared with 47.7% of respondents in facilities rated less favorably ($P \leq 0.01$). Compared with the lower quartiles,

significantly higher percentages of BFS respondents whose veteran family member was cared for in the highest-rated work environments also reported that providers always took time to listen to concerns (72.1% vs. 67.5%, $P \leq 0.01$), always provided medication and medical treatment that the patient and family wanted (77.5% vs. 74.0%, $P \leq 0.01$), always kept family members informed about the patient's condition and treatment (65.7% vs. 61.9%, $P \leq 0.05$), and that family was alerted when the patient was about to die (83.0% vs. 80.2%, $P \leq 0.05$).

Table 4 displays the unadjusted and adjusted odds of each BFS outcome in relation to the nurse work environment and nurse staffing levels. In the fully adjusted model, the odds of a BFS respondent giving an excellent overall rating of the veteran's care were 17% higher in the quartile of facilities with the best work environments as compared with the facilities in the lower three quartiles ($P \leq 0.05$). The odds of respondents reporting that providers always took time to listen to concerns and always provided desired treatments were 24% ($P \leq 0.01$) and 22% ($P \leq 0.05$) higher, respectively, in facilities with the best nurse work environments. A statistically significant association was not found between the work environment and the other nine BFS outcomes.

Nurse staffing was associated with four of the 12 BFS items. Each additional RN HPPD was associated with a 4% increase in the odds of a respondent giving an excellent overall rating on quality of EOL care ($P \leq 0.05$). Higher RN HPPD also were associated with greater likelihood of respondents reporting that they were alerted when the patient was about to die, they were always given enough emotional support after the patient's death, and the patient's personal care needs were always attended to.

Discussion

Our nationwide assessment of VA acute care facilities suggests that the nurse work environment and RN staffing levels are important determinants of EOL care quality. Our primary outcome in this study was the global rating of care received during the last month of life, which is an official VA performance measure. On this outcome, less than half (48%) of bereaved families of veterans reported that the care received was excellent. However, families were more likely to report that excellent care was received in facilities with better nurse work environments and more hours of care provided by RNs. The results of this study add to the growing literature base that documents a relationship between the organization of nursing care and patient satisfaction[10–12] and is one of the first to examine these relationships in the setting of EOL care.

In addition to the global measure, the nurse work environment demonstrated compelling associations with the likelihood of providers listening to patient concerns and provision of medications and treatments that the patient or family wanted. As nurses spend more time with patients than any other health care provider, nurses have direct knowledge of patient and family expectations for care.[24] Our findings substantiate the assertion that nurses working in environments in which they have collegial relationships with physicians, have autonomous practice, and opportunities to provide input into decision making are more likely to successfully advocate for patient and family needs and desires.

Additional hours of RN staffing were linked with higher likelihoods of BFS respondents reporting that the veteran's personal care needs were always met, the family was alerted before the patient's death, and the family received the emotional support that they needed after the patient's death. Our results are consistent with other research that has linked lower staffing levels to missed nursing care, including fewer opportunities to comfort and talk with patients, or provide education to patients and families.[25–27] Collectively, these findings speak to the need for well-staffed nursing care units, particularly around the actively dying and bereavement phases, to afford nurses with the necessary time to complete these activities.

Implications for Practice

With the growing focus on patient-centered health care, listening to patient or family concerns, providing requested treatments, and keeping family members informed are—and will continue to be—key indicators of quality EOL care.[1,28,29] Our findings highlight several areas that may be targeted in clinical settings to enhance these outcomes. Nursing and facility leadership should partner with nursing staff and palliative care teams within VA facilities to identify ways to optimize the work environment and also ensure that nurse staffing levels are adequate. Although this study focused specifically on RN staffing, the important contributions of other nursing staff, including nursing assistants, to quality of EOL care should be examined in future work. Each facility has access to their BFS and PES-NWI scores, as well as benchmarking data for these measures through the PROMISE Center and VANOD, respectively. Collaboration among palliative care teams, nursing departments, systems redesign teams, patient safety departments, and researchers using unit- and facility-level data to identify specific areas for improvement is recommended.

One strategy to improve work environments within facilities specifically related to EOL care is the continued expansion of training for health care professionals through programs, such as Education for Physicians in End-of-life Care (EPEC) and End-of-Life Nursing Education Consortium (ELNEC). Although initial efforts focused on staff from palliative care consultation teams and hospice and palliative care units, more recently this training has been extended to staff in general acute care units. The VA provided its first inter-professional "EPEC and ELNEC for Veterans" train-the-trainer workshop in 2011. Training health care providers in this manner can enhance understanding and interprofessional communication.[30–32] Better communication among team members and training opportunities can improve work environments, particularly the PES-NWI domains related to nurse-physician relationships and nursing foundations for quality of care, which capture aspects such as nursing staff development and continuing education.

Limitations

We acknowledge the presence of some limitations to our study. The retrospective and cross-sectional nature of the study limits the degree to which we can speak to the causality of the relationships observed. Although this study was conducted at the facility level, others have suggested that facility-level analyses may overestimate the association between nursing and outcomes.[22] We were unable to identify the exact unit on which patients died and, therefore, had to use aggregate statistics of nursing organization based on all likely eligible units.

Several coefficients for our independent variables trended in the expected direction but did not reach statistical significance. This may be related to the wording of the BFS, which does not specifically mention nurses or nursing care but instead referred to actions of doctors and other staff. Although we hypothesized that our outcomes could all theoretically be linked to nursing care, participants may not have been considering nurses when responding to some of the items. Based on these limitations, we recommend additional or adapted BFS measures that capture bereaved families' perceptions of EOL nursing care explicitly. This would allow researchers to assess more precisely the impact of nursing care on EOL outcomes.

Conclusion

Family assessments of care received by veterans at the EOL reveal multiple areas for improvement. Our study offers two promising strategies related to the organization of nursing services within VA facilities that may be used to optimize the quality of care provided to patients and their families: investing in the improvement of the nurse work environment and bolstering the number of RN hours of care. Future work is needed to investigate these relationships outside the VA as nursing is an essential and universal component of EOL care.

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Table 1

Patient Characteristics (n = 4908)

Characteristic	Statistics
Male, *n* (%)	4808 (98.0)
Age (by category), *n* (%)	
18–49	62 (1.3)
50–59	506 (10.3)
60–69	1450 (29.5)
70–79	1152 (23.5)
80–89	1399 (28.5)
>90	339 (6.9)
Race/ethnicity, *n* (%)	
White	3643 (74.2)
Nonwhite	1112 (22.7)
Unknown	153 (3.1)
Next of kin (BFS respondent), *n* (%)	
Spouse	2261 (46.1)
Child	1410 (28.7)
Sibling	597 (12.2)
Other/unknown	640 (13.0)
Medical conditions, *n* (%)[a]	
Kidney disease	2631 (53.6)
Pneumonia	2158 (44.0)
Cancer	1488 (30.3)
Heart failure	1336 (27.2)
Chronic obstructive pulmonary disease	1289 (26.3)
Coronary artery disease	1229 (25.0)
Dementia	705 (14.4)
Liver disease	514 (10.5)
PTSD	490 (10.0)
Stroke	388 (7.9)
Received palliative care consult, *n* (%)	2651 (54.0)
Had DNR at time of death, *n* (%)	4250 (86.6)
Days as inpatient in last month of life, mean (SD), median	13.9 (10.1), 11.0

BFS = Bereaved Family Survey; PTSD = post-traumatic stress disorder; DNR = do-not-resuscitate.

[a]Multiple conditions may be coded for each patient. Conditions included diagnoses listed in the patient's medical record in the last month of life.

Table 2

Distribution of Patients by Nursing and Hospital Characteristics (n = 4908)

Characteristic	Count (%)
RN HPPD	
7 or less	1373 (28.0)
7 to <8	1376 (28.0)
8 to <9	757 (15.4)
9 to <10	892 (18.2)
10 or more	510 (10.4)
Nurse work environment	
Better (75th percentile and above)	1272 (25.9)
Mixed (26th–74th percentile)	2455 (50.0)
Worse (25th percentile and below)	1181 (24.1)
Facility complexity level	
High	4152 (84.6)
Medium	611 (12.5)
Low	145 (3.0)
Location	
Rural	356 (7.3)
Urban	4552 (92.8)
Geographic region	
Northeast	849 (17.3)
South	2356 (48.0)
Midwest	826 (16.8)
Mountain	278 (5.7)
West	599 (12.2)

RN HPPD = registered nurse direct hours per patient day.

Percentages may not add to 100 because of rounding.

Table 3

Bereaved Family Survey Outcomes Stratified by Nurse Work Environment (n = 4908 Patients)

Outcome	No. of Respondents Agreeing (%)			
	Overall	In Top Quartile Facilities (75th Percentile and Above)	In Lower Quartile Facilities (0–75th Percentile)	*P*-value
Overall rating of patient's care was excellent	2355 (48.0)	651 (51.8)	1704 (47.7)	0.01
Providers always took time to listen to concerns	3286 (67.0)	894 (72.1)	2392 (67.5)	0.003
Providers always provided medication and medical treatment that the patient and family wanted	3541 (72.2)	952 (77.5)	2589 (74.0)	0.01
Providers were always kind, caring, and respectful	3821 (77.9)	1006 (80.3)	2815 (78.9)	0.30
Providers always kept family members informed about the patient's condition and treatment	3017 (61.5)	817 (65.7)	2200 (61.9)	0.02
Family was alerted when the patient was about to die	3851 (78.5)	1032 (83.0)	2819 (80.2)	0.03
Providers always attended to patient's personal care needs	3037 (61.9)	816 (67.3)	2221 (64.5)	0.08
Providers always gave enough emotional support to patient and family prior to death	2747 (56.0)	722 (58.5)	2025 (57.7)	0.63
Providers always gave enough emotional support to the family after the patient's death	2938 (59.9)	772 (63.3)	2166 (62.5)	0.62
Patient's pain never made him or her uncomfortable[a]	990 (20.2)	263 (25.4)	727 (24.3)	0.48
Providers always gave enough spiritual support	2766 (56.4)	738 (61.2)	2028 (59.1)	0.20
Patient's re-experience of combat stress never made him or her uncomfortable[b]	3660 (74.6)	959 (85.0)	2701 (84.0)	0.44

Missing data for 10 of 12 outcomes ranged from 1.6% to 5.5%. The pain and post-traumatic stress disorder outcomes had 17.9% and 11.5% missing data, respectively, because of the construction of the item. *P*-value generated by chi-squared test.

[a] Includes only those patients whose family responded that the veteran experienced pain.

[b] Includes only those patients whose family reported that the veteran re-experienced stress and emotions that they had when they were in combat.

Table 4

ORs Indicating the Effects of Nurse Work Environment and Nurse Staffing on BFS Outcomes (n = 4908 Patients)

	Unadjusted Model	Fully Adjusted Model
Outcome	**OR (95% CI)**	**OR (95% CI)**
Overall rating of patient's care was excellent		
Nurse work environment (top quartile)	1.15 (0.98–1.34)	1.17 (1.01–1.34)[a]
Nurse staffing	1.06 (1.02–1.10)[b]	1.04 (1.00–1.09)[a]
Providers always took time to listen to concerns		
Nurse work environment (top quartile)	1.24 (1.04–1.47)[a]	1.24 (1.07–1.44)[b]
Nurse staffing	1.00 (0.97–1.04)	1.02 (0.98–1.07)
Providers always provided medication and medical treatment that the patient and family wanted		
Nurse work environment (top quartile)	1.23 (1.04–1.45)[a]	1.22 (1.03–1.45)[a]
Nurse staffing	0.98 (0.93–1.03)	0.99 (0.94–1.05)
Providers were always kind, caring, and respectful		
Nurse work environment (top quartile)	1.08 (0.90–1.30)	1.09 (0.92–1.29)
Nurse staffing	1.01 (0.95–1.07)	1.01 (0.96–1.07)
Providers always kept family members informed about the patient's condition and treatment		
Nurse work environment (top quartile)	1.18 (0.99–1.42)	1.17 (0.99–1.40)
Nurse staffing	0.99 (0.95–1.03)	1.00 (0.96–1.04)
Family was alerted when the patient was about to die		
Nurse work environment (top quartile)	1.17 (0.98–1.39)	1.15 (0.97–1.35)
Nurse staffing	1.05 (1.00–1.10)[a]	1.06 (1.01–1.12)[b]
Providers always attended to patient's personal care needs		
Nurse work environment (top quartile)	1.11 (0.94–1.31)	1.14 (0.97–1.33)
Nurse staffing	1.04 (0.99–1.10)	1.05 (1.00–1.11)[a]
Providers always gave enough emotional support to patient and family prior to death		
Nurse work environment (top quartile)	1.02 (0.86–1.21)	1.01 (0.86–1.18)
Nurse staffing	1.02 (0.98–1.07)	1.02 (0.98–1.07)
Providers always gave enough emotional support to the family after the patient's death		
Nurse work environment (top quartile)	0.99 (0.84–1.17)	0.97 (0.85–1.11)
Nurse staffing	1.08 (1.02–1.14)[b]	1.07 (1.02–1.13)[b]
Patient's pain never made him or her uncomfortable[c]		
Nurse work environment (top quartile)	1.05 (0.89–1.24)	1.11 (0.93–1.32)
Nurse staffing	1.02 (0.97–1.07)	1.03 (0.99–1.08)
Providers always gave enough spiritual support		
Nurse work environment (top quartile)	1.07 (0.92–1.24)	1.06 (0.94–1.20)
Nurse staffing	1.04 (0.99–1.09)	1.02 (0.98–1.06)
Patient's re-experience of combat stress never made him or her uncomfortable[d]		
Nurse work environment (top quartile)	1.07 (0.85–1.34)	1.11 (0.91–1.36)

	Unadjusted Model	Fully Adjusted Model
Outcome	**OR (95% CI)**	**OR (95% CI)**
Nurse staffing	1.01 (0.97–1.06)	1.01 (0.96–1.06)

OR = odds ratio; BFS = Bereaved Family Survey.

Sample size varies for each outcome because of missing data (see Table 3).

Estimates for work environment reflect the difference in the odds of being cared for in better work environments (≥75th percentile) as compared with mixed/worse environments (0th–75th percentile). Estimates for nurse staffing indicate change in odds associated with one additional registered nurse hour per patient day. Fully adjusted model accounts for patient sex, age category, race/ethnicity, BFS respondent/next of kin, the presence/absence of 10 medical conditions, days of inpatient hospitalization in last month of life, whether a palliative care consult was received, the presence of do-not-resuscitate order, hospital complexity score, rural/urban location, and geographic region.

[a] $P \leq 0.05$.

[b] $P \leq 0.01$.

[c] Includes only those patients whose family responded that the veteran experienced pain.

[d] Includes only those patients whose family reported that the veteran re-experienced stress and emotions that they had when they were in combat.