Organizational Determinants of Work Outcomes and Quality Care Ratings Among Army Medical Department Registered Nurses

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Abstract

The Practice Environment Scale of the Nursing Work Index, the Maslach Burnout Inventory, and several single-item measures were administered to registered nurses (RNs) working within 23 U.S.-based Army Medical Department (AMEDD) hospitals. Data were analyzed with logistic regression for nested data. Unfavorable nursing practice environments had a substantial association with job dissatisfaction (OR 13.75, $p < .01$), emotional exhaustion (OR 12.70, $p < .01$), intent to leave (OR 3.03, $p < .01$), and fair to poor quality of care (OR 10.66, $p < .01$). This study provides the first system-wide analyses of nursing practice environments in AMEDD hospitals in the U.S. Similar to findings in civilian samples, poor quality work environments are associated with less favorable RN work outcomes and quality of care ratings.

Keywords

nursing practice environment; military nursing; burnout; intent to leave; job satisfaction; quality care

Although the shortage of registered nurses (RNs) has leveled off in many areas of the United States (U.S.), experts caution this reprieve may be short lived (Buerhaus, 2008; Clarke & Cheung, 2008). Leading workforce analysts predict the shortage of RNs will worsen, with the deficit growing to 285,000 full time equivalents by 2020, and double that number by 2025 (Buerhaus, Staiger, & Auerbach, 2008). The current economic downturn may provide relief for some health care organizations as RNs stay in or reenter the workforce because of self-imposed delays in retirement and job losses by other wage earners in their households. However, these gains could reverse once the economy rebounds.

Recruitment and retention of qualified nurses will continue to be a challenge for health care organizations as the RN workforce ages and the demand created by an aging baby boomer population outstrips the RN supply. A professional work environment for nurses, particularly in the inpatient setting, is now recognized for its association with retaining staff (Rondeau &

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Wagar, 2006; Stone et al., 2006), achieving good nurse and patient outcomes (Aiken, Clarke, Sloane, Lake, & Cheney, 2008), and providing safe patient care (Laschinger & Leiter, 2006; Mark et al., 2008). Suggestions for improving work environments for nurses have been advanced by a number of nursing and regulatory organizations, and several foundations have allocated funding for research about ways to enhance the practice environment (Ulrich, Buerhaus, Donelan, Norman, & Dittus, 2005).

As health care organizations throughout the U.S. compete for a fixed supply of RNs, the Army Medical Department (AMEDD) also is striving to recruit and retain both military and civilian nursing staff (Army Nurse Corps, n.d.). Although civilian health care organizations have been able to offer signing bonuses and other financial incentives to attract and retain nurses (Buerhaus, Donelan, Ulrich, Norman, & Dittus, 2006), the AMEDD has limited flexibility in adjusting wages and bonuses for its nurses. Therefore, creating excellent work environments that attract and retain military and civilian RNs may be even more difficult for the AMEDD than for other health care systems that can use financial rewards. Yet, little is known about nursing work environments in the AMEDD and whether the same professional practice characteristics associated with positive outcomes in the civilian sector exist in the AMEDD. In this article, the investigators present the first system-wide examination to date of the nursing practice environments within U.S.-based AMEDD hospitals from the perspective of the military and civilian staff RNs who work in them. Furthermore, in this article we detail our investigation of the associations between organizational characteristics, selected RN work outcomes (i.e., job dissatisfaction, emotional exhaustion, and intent to leave the AMEDD workforce) and RN ratings of the quality of patient care. The study results add to the current research on work environments by focusing on a seldom studied organization, the U.S. Army hospital.

BACKGROUND

The U.S. Military Health System (MHS), one of the largest health systems in the world, is comprised of the medical departments of the Army, Navy, and Air Force (Department of Defense, 2007). The MHS serves 9.1 million beneficiaries, primarily active duty service members, retirees, and the family members of active duty and retired service members. Of the three military medical departments comprising the MHS, the AMEDD is the largest. The AMEDD serves five million MHS beneficiaries, and operates nearly 40 hospitals and clinics in the U.S. and abroad (AMEDD, 2009), with additional medical assets (e.g., field hospitals) in locations around the world.

Army hospitals employ a mixture of both active duty Army and civilian nursing personnel who are RNs, licensed practical nurses (LPNs), and unlicensed personnel (nursing assistants and corpsmen). In Army hospitals, there are two categories of RNs employed full-time: Army nurses, who are active duty RNs, and Army civilian nurses, who are federal employees working for the Army. In addition to these regularly scheduled employees, Army hospitals may supplement staffing with contract RNs (i.e., agency or temporary) who have no individual affiliation with the Army. Contract nurses are employed by the AMEDD in some geographic locations more than in others. Where AMEDD staffing shortages are more acute, contract RNs may represent a high proportion of the total staff on a unit. Another group of RNs found in AMEDD hospitals is Army reservists, who generally train 1 weekend a month and 2 weeks a year in Army hospitals so they can be ready to serve full-time should an emergent need arise. Army reservists were not included in this study.

Army nurses have several important differences from the Army civilian nurses in the AMEDD and from the national RN population. A Bachelor of Science in Nursing (BSN) degree is the minimum entry requirement for Army nurses. Only 34% of the national RN population

possesses this level of education (Department of Health and Human Services [DHHS], 2006). Army nurses are more likely than nurses in the civilian sector to be men (35% versus 6%) and represent ethnic and racial minorities (36% versus 18%; Army Nurse Corps Branch, U.S. Army Human Resources Command, 2009; DHHS). Army nurses have responsibilities to maintain not only their clinical competency but also their soldier skills such as weapons firing and physical fitness. As Army officers, they are expected to advance in leadership, education, skill, and responsibility throughout their careers. In support of these professional advancements, Army nurses are also quite geographically mobile, moving to different locations about every 3–4 years. Even more frequently, Army nurses move to positions of increased responsibility within the same hospital as part of a career enhancement strategy. In addition, they deploy to support war, conflict, and humanitarian efforts throughout the world.

Army civilian nurses are not required to possess a BSN in nursing; many hold associate degrees. However, they are a more experienced group of staff nurses than their Army staff nurse colleagues. Army civilian nurses generally have at least a year of nursing experience when they enter the federal system. Unless their spouses are active-duty military, the Army civilian nurses tend to stay in the same geographic location and remain in staff nurse positions longer than their Army nurse counterparts. Whereas Army nurses move quickly into leadership positions, the career trajectories for Army civilian nurses are much less focused on advancement. Therefore, they represent a stable, critical mass of highly experienced staff nurses.

Because of employment and demographic characteristics, Army nurses and Army civilian nurses working together in the same hospital may differ in perceptions of their work environments, in their career options, and in their decisions to terminate employment with the AMEDD. The highly structured, bureaucratic environments and demands of military life might hinder the flexibility and stability that characterize good work environments (Stone et al., 2006). Despite these demands, there are many opportunities for advancement for Army nurses, and to a lesser extent Army civilian nurses, including educational benefits and leadership opportunities. Moreover, the military rank structure may facilitate more collegial working relationships between AMEDD nurses and physicians compared to those found in civilian settings (Foley, Kee, Minick, Harvey, & Jennings, 2002).

LITERATURE REVIEW

The outcomes of interest in this study were selected to develop evidence on AMEDD nurses within a theoretical framework linking nursing system factors to patient and nurse outcomes. This framework, first presented by Aiken, Sochalski, and Lake (1997), linked hospital organizational forms such as magnet hospitals or dedicated AIDS units through operant mechanisms including nurse autonomy, control, and nurse–physician relationships, to nurse and patient outcomes. Lake (1999) modified the framework to specify two dimensions of nursing organization: nurse staffing and the practice environment. Lake hypothesized that higher staffing, better qualified nurses, a more stable staff, and a practice environment that facilitates professional nursing autonomy would result in better nurse and patient outcomes. The nurse job outcomes that Lake specified were satisfaction, stress, burnout, and turnover. Three of these outcomes were addressed in the current study: satisfaction, burnout, and intent to leave, as a precursor of turnover. Dissatisfaction was chosen rather than satisfaction to be consistent with the literature.

Literature shows that dissatisfied nurses are more likely to experience burnout and leave their jobs (Aiken et al., 2001; Aiken, Clark, Sloane, Sochalski, & Silber, 2002; Vahey, Aiken, Sloane, Clarke, & Vargas, 2004). Burnout, a unique job-related stress syndrome caused by chronic work stressors (Maslach, Jackson, & Leiter, 1996), is more predictive than job

satisfaction of persons' intentions to leave their jobs (Aiken et al., 2002). Types and degrees of work stressors that lead to burnout remain equivocal, but seem to have more to do with the characteristics of the work environment than with unit type or individual factors (Coomber & Barriball, 2007; Laschinger & Leiter, 2006).

Voluntary turnover is preceded by and strongly associated with intent to leave a position (Hayes et al., 2006). Antecedents to voluntary turnover intentions include burnout, work stress, lack of collaboration among health care professionals, ineffective management, job dissatisfaction, and demographic factors such as younger age, higher education, and having children in the household (Coomber & Barriball, 2007; Hayes et al.; Spetz, Rickles, Chapman, & Ong, 2008).

Better practice environments have been associated with low levels of burnout and better patient outcomes, including lower mortality and higher satisfaction (Aiken et al., 2008; Kazanjian, Green, Wong, & Reid, 2005; Mark et al., 2008). Certain professional practice environments, such as those found in magnet hospitals, have been associated with low nurse turnover. Findings from more than two decades of research consistently reveal that nurses who work in magnet hospitals are more satisfied professionally and more likely to stay in organizations where they are valued members of the health care team, and where they have control over resources for providing patient care and authority to apply those resources as needed (Kramer & Schmalenberg, 2002).

Studies exploring the culture and dynamics of the nursing practice environment within the AMEDD are dated, sparse, and inconsistent in their findings. One study from the 1990s found poor nurse–physician communication (Anderson, Maloney, Oliver, Brown, & Hardy, 1996) and another found lack of autonomy in Army nursing practice environments (Maloney, Anderson, Gladd, Brown, & Hardy, 1996). Other researchers compared nurses working in magnet hospitals during the mid-1990s to Army nurses and found that the latter were more satisfied with hospital organizational structure, professional practice, management, and leadership, and less satisfied than magnet nurses with professional development opportunities (Yoder, 1995). Yoder also noted Army nurses' concern about the incongruence between the organizational emphasis on high quality care and the lack of recognition and rewards for direct patient care providers within AMEDD hospital settings. More recently, Foley et al. (2002) found practice environments in two Army hospitals characterized by a high degree of autonomy, control over practice, clinical expertise of nursing staff, and collegiality with physicians. When nurses in the Army hospitals were compared to a group of nurses in civilian hospitals, however, the autonomy and control scale scores were lower in the Army hospitals. Better patient outcomes were associated with more positive work environments in the Army hospitals (Kee et al., 2005).

Intent to leave active duty service has been studied periodically, but results rarely have been published, and some are almost two decades old. Of Yoder's (1995) Army nurse sample, 37% intended to leave military service before they became eligible for Army retirement at 20 years, and 28% were ambivalent about staying or leaving. Yoder found that older, more experienced nurses were more likely to make a career of the Army, as were those who had a career development relationship (e.g., coaching or mentoring) at some point in their professional development, although the effect size was small and determined to have little practical relevance. Reineck (1990) investigated intent to leave among Army civilian staff nurses in nine Army hospitals and found that group cohesion, communication, career intentions, and satisfaction with compensation directly predicted job satisfaction and indirectly predicted intent to leave; younger age and lower job satisfaction were directly associated with intent to leave. These earlier studies established the need for the current evaluation of the practice environment, using instruments and methods suitable to contemporary conditions.

Therefore, we sought to answer the following research questions:

1. How do RNs across the AMEDD rate their practice environments?

2. What are the levels of job dissatisfaction, high emotional exhaustion, and job termination intentions among AMEDD RNs?

3. How do AMEDD RNs rate the quality of patient care provided in their respective units?

4. What are the contributions of nurse staffing and the practice environment in predicting RN work outcomes and RN-rated quality of care?

METHODS

The population for this study consisted of Army nurses and Army civilian RN staff nurses who worked in inpatient units within the Army's 23 U.S. hospitals (Fig. 1) in 2002 and 2003. Contract RNs were included as civilian RNs if they worked 2 days or more per week on that particular unit. Contract nurses were regularly scheduled to fill frequent staffing voids at the time the study was conducted. We believed exposure to the Army hospitals for at least 2 days per week was adequate to immerse the contract nurses in the unit practice environment.

After human subjects approval was obtained from seven Army Institutional Review Boards, nurses were asked to complete an anonymous survey that included demographic information, the Practice Environment Scale of the Nursing Work Index (PES-NWI; Lake, 2002), the Maslach Burnout Inventory (MBI; Maslach et al., 1996), and a series of single-item questions that measured job satisfaction, intent to leave current employment, quality of care, numbers of patients routinely cared for on a shift, and numbers and types of staff with whom the nurse typically worked.

The PES-NWI was used to measure qualities of the practice environment (Lake, 2002). The PES-NWI is a nationally endorsed nursing care performance standard (National Quality Forum [NQF], 2004) that has been tested for national implementation by the Joint Commission (2005), and has been recently re-endorsed by the NQF (2009). Nurses indicated the extent to which certain work environment attributes were present in their current job using a Likert-type scale ranging from 1 *strongly disagree* to 4 *strongly agree*. From the PES-NWI, five subscales were calculated: Nurse Participation in Hospital Affairs; Nursing Foundations for Quality of Care; Nurse Manager Ability, Leadership and Support; Staffing and Resource Adequacy; and Collegial Nurse–Physician Relations. A Composite score was calculated to represent an overall measure of the practice environment.

Reliability and validity of the PES-NWI and its subscales were established in civilian samples (Lake, 2002). Lake reported internal consistency reliabilities of .71–.84 for the subscales, with the subscale structure supported by factor analysis. For the current sample, the Cronbach's alpha for the entire instrument was .94, with subscale alphas ranging from .82 to .87. A recent critical review concluded that the PES-NWI was the preferred instrument for measurement of the organization of nurses' work (Bonneterre, Liaudy, Chatellier, Lang, & de Gaumaris, 2008). Bonneterre et al. evaluated the validity of questionnaires to measure psychological and organizational work factors in nursing staff in a review of articles published between 1980 and 2008 found the PES-NWI to possess the most robust aspects of content, construct, discriminant, and concurrent validity as compared to three other measures.

After examining subscale means, the PES-NWI score was respecified as a categorical variable (i.e., favorable, mixed, and unfavorable) before entering it into multivariate analysis. The rationale for specifying both the PES-NWI and the MBI as categorical variables in analytic

models is presented below. The categorization of the PES-NWI is consistent with recent literature in which the environment was classified as *favorable* if scores exceeded 2.5 (the theoretical midpoint) on four or five subscales, *mixed* if scores exceeded 2.5 on two or three subscales, and *unfavorable* if scores exceeded 2.5 on one or none of the subscales (Friese, Lake, Aiken, Silber, & Sochalski, 2008; Lake & Friese, 2006).

This categorization of the PES-NWI is sound conceptually and empirically. The conceptual basis for the PES-NWI categories is as follows. The theoretical midpoint separates nurses who agreed, on average, that the subscale items were present in their current job from those who disagreed. Empirically, researchers have shown better nurse and patient outcomes in hospitals with the favorable rating as compared to the unfavorable rating. This is the first study to evaluate PES-NWI category measures at the nurse-level.

The MBI was used to measure burnout, a syndrome consisting of emotional exhaustion, depersonalization, and low personal accomplishment (Maslach et al., 1996). The items in the MBI indicate the frequency with which a series of job related feelings occur, from *never* (scored as 0) to *every day* (scored as 6). Reliability and validity of this instrument have been reported for a variety of groups (Maslach et al.). More recently, in a sample of nurses, internal consistency reliability for the subscales ranged from .78 to .91 (Leiter & Laschinger, 2006). Of the three MBI components, emotional exhaustion has been identified as the driving force behind burnout (Aiken et al., 2008; Laschinger & Leiter, 2006; Leiter & Laschinger, 2006). The 9-item emotional exhaustion scale of the MBI was therefore used to represent the key feature of burnout. Cronbach's alpha for this scale with the current sample was .91.

In the analysis, emotional exhaustion was dichotomized, with scores of 27 or above indicating high emotional exhaustion, based on the established norms for nurses and physicians (Maslach et al., 1996). Scores lower than 27 indicated average to low emotional exhaustion. The emotional exhaustion cut point was the top tercile from a normative sample published by Maslach et al. (1996). More recent data have shown that burnout scores in U.S. samples have increased (Aiken et al., 2001). However, we found it useful to build evidence systematically by applying the same cut point used by previous researchers (Aiken et al., 2002, 2008).

Our rationale for turning the scores on the PES-NWI and MBI instruments from interval level to categorical level was to increase their utility to managers and researchers. Results are the same in direction and level of significance whether the PES-NWI and MBI variables are specified as continuous or categorical measures. However, category specification yields findings that are more interpretable and actionable to the consumers of the research. For example, when the PES-NWI and MBI are measured as continuous variables, the result would be stated as "an increase of 1 level on the PES (e.g., from agree to strongly agree, on average) would be associated with an increase on the burnout score of *X* points." Neither of these changes is obvious for a manager or researcher to interpret. Therefore, we find it preferable to communicate categories with theoretical and empirical bases: favorable/mixed/unfavorable practice environments and "high" burnout or not. Then the result can read, "A shift from an unfavorable to a favorable practice environment is associated with a reduction in the odds of being burned out of *Y*%."

The main limitation of this approach is that categorization sacrifices information. However, our overriding interest is to identify the direction and general magnitude of a relationship rather than to characterize a linear relationship precisely between the environment and nurse outcomes. The question becomes, What are the appropriate cut points to establish categories? As noted above, our cut points come from theoretical, empirical, and normative sources and are in the existing literature upon which this study builds.

Job satisfaction, intent to leave, and quality of care ratings were obtained by using single-item measures. These single-item measures, deemed appropriate for measuring global constructs (Patrician, 2004), were modeled on those used in the Pennsylvania arm of the International Hospital Outcomes Study (Aiken et al., 2001). The job satisfaction question was, "On the whole, how satisfied are you with your present job?" Responses were obtained on a 5-point Likert-type scale, and ranged from 1 *very dissatisfied* to 5 *very satisfied, with 3 as neutral*. The five categories were collapsed into two: dissatisfied and satisfied. The neutral responses were removed from analysis.

To determine the likelihood and motivation for leaving one's present job, nurses were surveyed about whether or not they intended to leave their jobs, the period in which they expected to resign, and the rationale for departure. Because intention to leave within a year if no military obligations existed was our focus, we also asked the nurses whether they would leave their current job if they could (i.e., if they or their military spouse had no military obligations or payback time to fulfill) and their planned time period for resignation. This particular variable, leaving conditioned on no obligation, was re-categorized as intending to leave versus not intending to leave.

The quality of care question, "Overall, how would you rate the quality of patient care on your unit?" was measured on a 4-point scale ranging from 1 *poor* to 4 *excellent*. The quality of care variable was collapsed into a dichotomous variable indicating poor/fair quality and good/ excellent quality.

Staffing variables were derived from survey responses. Nurses indicated the numbers and types of health care providers present on a usual shift as well as the numbers and acuity categories of patients for whom they cared. From these data, a patient-to-RN ratio was calculated, as was RN skill mix (percentage of RNs relative to the total number of nursing providers on a typical shift). Nurses' reports of staffing have been used in other research to calculate hospital level staffing variables from the last shift the nurse had worked (Aiken et al., 2008; Friese et al., 2008). Aiken et al. (2002) discussed the advantage in nurse-reported staffing over measures derived from administrative databases. Nurses' reports reflect direct care measures that are missing from other existing data sets, such as that of the American Hospital Association, which reports the entire population of nurses, not just those providing direct care. Consistent with prior research, responses from nurses who reported caring for no patients or for more than 20 patients were assumed to be outliers and therefore excluded from analyses (Aiken et al., 2002, 2008).

Descriptive statistics were used to summarize the data. Chi-square and *t* tests were used to examine differences between Army and civilian nurses within the sample. Once the assumptions of multivariate logistic regression were met (Meyers, Gamst, & Guarino, 2005), robust logistic regression models were fit with STATA (Version 10) to determine the variables that accounted for RN work outcomes and nurse-rated quality of care. Robust regression preserved the data structure of individual level data, yet accounted for the nesting of nurses within hospitals (Lake, 2006). Missing data were handled with listwise deletion.

We considered and tested both robust and hierarchical logistic regression as modeling approaches. Both models yielded equivalent results. We therefore chose robust regression for our full analysis because it handles the general problem of correlated observations; the hierarchical model only handles the specific case of hierarchical structure. We considered and tested modeling the explanatory variables at the individual nurse-level or having a mix of nurse- level demographic and qualification variables combined with aggregate hospital-level variables for staffing, skill mix, and the practice environment.

We selected the "all-individual level variables" specification in STATA for conceptual and empirical reasons. Conceptually, this approach is superior to using hospital-specific aggregates because the most meaningful determinant of RN work outcomes is the nurse's particular experience (i.e., with number of patients, skill mix, and practice environment). This reasoning contrasts with other research questions that try to link nursing system factors (e.g., number of patients, skill mix, and/or environment) to patient outcomes. Because we could not link patients to particular nurses, we relied on hospital-level aggregates to represent the patients' specific experience of nursing care. Empirically, the all-individual-level approach is the most appropriate and informative because it accounts for the true data structure of nurses' own reports of the independent (patient load, skill mix, and practice environment) and dependent variables (satisfaction, burnout, intent to leave, and quality of care rating). Our decision was supported by the results: the all-individual-level models yielded more robust coefficients and model-fit statistics. Two coefficients were larger and had a higher significance level with this approach. Further, two results in the mixed-level approach were counter to hypotheses, leading us to infer the use of aggregate (hospital-level) staffing values was not appropriate because it masked nursing-unit level staffing variation.

RESULTS

Of the 1,793 surveys that were mailed, 955 were completed and returned, representing an overall response rate of 53%, with a response range by hospital of 42–100%. The respondents consisted of civilian (63%) and military (37%) staff RNs employed in Army hospital inpatient units. Although the researchers did not track the civilian versus military response rates, evidence from other studies demonstrates a similar inpatient workforce composition of approximately 60% civilian and 40% military (Loan, Brosch, McCarthy, & Patrician, 2005). The sample was mostly female, married, Caucasian, and BSN prepared (see Table 1). There were statistically significant differences between Army nurses and Army civilian nurses in gender, highest nursing degree, and children in the household; Army nurses were more likely to be male and prepared at the BSN level and less likely to have children in the household. Army nurses also were younger and less experienced than their civilian counterparts.

On average across all unit types, each RN cared for 4.74 patients. The distribution was positively skewed. Over 60% of the nurses reported taking care of four or fewer patients, and 10% of RNs typically had five patients. The remaining 29% of nurses typically cared for more than five patients. The average RN skill mix was 61%; that is, 61% of the total staff on a typical shift was RNs. The remaining 39% of personnel were a mix of Army and Army civilian LPNs and nursing assistants.

Mean scores from the PES-NWI are displayed in Table 2. All scores in the full sample are above the midpoint of 2.5 on the 4-point response scale, indicating more favorable than unfavorable ratings overall. However, differences between Army nurses' and Army civilian nurses' mean responses were evident. Army nurses rated Nurse Participation in Hospital Affairs and Nursing Foundations for Quality of Care higher than their civilian counterparts.

Table 3 shows RN work outcomes and quality of care ratings. Job dissatisfaction was reported among 27% of the total sample. Of the total sample, 30% had high emotional exhaustion scores. Significantly more Army nurses had high emotional exhaustion scores than their Army civilian counterparts.

Accounting for Army nurses who left their positions due to normal military assignment changes, civilian nurses' military spouses' reassignments to different Army locations or reassignments within the hospital, 34% of the sample intended to leave their positions within

1 year. There were no significant differences between the Army nurses and their civilian counterparts on intentions to leave.

Quality of care was rated as fair to poor by 16% of the sample. There was good agreement between the Army and civilian nurses on unit level quality of care ratings.

Table 4 shows the results of multivariate logistic regression analyses for all variables in the analyses. For each outcome, the strongest consistent predictor of negative RN work outcomes was an unfavorable practice environment. Compared with nurses who reported favorable work environments, nurses who reported unfavorable work environments were nearly 14 times more likely to experience job dissatisfaction, 13 times more likely to experience emotional exhaustion, three times more likely to leave their job within the year, and 11 times more likely to report fair to poor care quality, controlling for all other independent variables in the model. The practice environment effect was largest for emotional exhaustion.

Neither skill mix nor staffing had an effect on the outcomes. Staff nurses with a BSN were more likely than those with an associate degree to experience negative work outcomes. Caucasian nurses were more likely than other racial groups to experience emotional exhaustion and to report fair to poor patient care quality.

DISCUSSION

Nurses in the AMEDD, and particularly Army nurses, are demographically different from the nonmilitary workforce in respect to education, gender, and race. However, controlling for whether one is in the Army, we have shown racial and educational effects on nurse work outcomes. The connection between Caucasian race and emotional exhaustion was unexpected. However, the educational effect on job dissatisfaction and emotional exhaustion may be associated with increased and unmet expectations of more highly educated professionals. These two outcomes, combined with the possibility of more job opportunities for BSN-prepared nurses outside the Army, could explain the intention for Army nurses to seek employment elsewhere.

In comparison to civilian samples, staffing is more robust in Army hospitals where the mean number of patients per nurse is 4.74, and in which 71% of nurses reported taking care of five or fewer patients on a typical shift. This ratio is much higher than in the Pennsylvania sample (Aiken et al., 2001) in which nurses in half of the hospitals reported caring for more than five patients on their last shift.

The staff nurses rated their work environments favorably overall (i.e., above the scale midpoint). With the exception of their responses on the PES-NWI Nurse Manager subscale, AMEDD nurses rated their hospitals somewhat more favorably than other researchers have reported in the literature. For example, most of the scores obtained in our Army sample fall between those of the Aiken et al. (2001) Pennsylvania sample of the International Hospital Outcomes Study (on the lower end of the scale) and those of certified magnet hospitals (at the higher end of the scale; Lake, 2002).

In our study of RNs in 23 Army hospitals, the lowest scores were for the Nurse Manager Ability and Support subscale. Although the Army provides a 2-week Head Nurse Leader Development Course to prepare nurses for the nurse manager role, most nurse managers in AMEDD hospitals are Army nurses who rotate to different positions at least every 3 years. Perhaps less frequent rotations would allow nurse managers to more fully develop the required skill set for such a critical position.

Conversely, the nurse–physician relationships score is equal to that of certified magnet hospitals (Lake, 2002). This finding is similar to that of Foley et al. (2002) who also studied nurses in Army hospitals. It might be explained by the rank structure inherent in the military. Earned by a combination of potential to succeed at the next highest rank level, past accomplishments, and longevity, rank serves as an equalizer among various professional groups. In the Army, rank is respected even more so than one's professional discipline.

There were significant differences between Army and civilian nurses on two of the PES scales. Although the Nursing Foundations for Quality Care scale was significantly different between the two groups, the difference is minute, and could be simply due to the large sample size. In contrast, the Nurse Participation in Hospital Affairs scale was significantly different by a larger amount (half an *SD*) and higher among Army nurses, reflecting differences between the groups on involvement in the workplace. To fulfill leadership development requirements, Army staff nurses are strongly encouraged to assume other professional duties in addition to their main role. Many of them serve as unit representatives on various nursing quality, practice, and education committees, and therefore, may perceive a higher level of participation within the hospital.

Nurses who work in Army hospitals experience less burnout and less job dissatisfaction than nurses in Pennsylvania hospitals (Aiken et al., 2001; 30% versus 43% and 27% versus 41%, respectively), yet rated the quality of care provided in their units as poor to fair comparably to the Pennsylvania nurses (Aiken et al., 2008; 16% versus 13%). The differences in burnout and job dissatisfaction warrant further investigation. They may be due to the apparently higher staffing levels in Army hospitals as compared to general hospitals in Pennsylvania, but conclusions are premature given the comparison is between a single state's hospitals in 1999 and the population of Army hospitals in 2003. The multivariate model results indicate that staffing variations within the Army hospital system are not associated with burnout or job dissatisfaction. Perhaps nurses who choose to work in Army hospitals find the work more fulfilling than those working in civilian hospitals.

When normal military relocations and reassignments within the hospital are considered, AMEDD RNs' intention to leave is considerably higher than that of the Pennsylvania sample (Aiken et al., 2001; 34% and 23%, respectively). This finding is surprising given that the Army sample had relatively less emotional exhaustion and dissatisfaction. In post hoc analyses we found a strong association (Chi square = 55, $p < .001$) between satisfaction and intent to leave, supporting the idea that AMEDD RNs' intentions to leave are influenced by job satisfaction as well as other unmeasured factors. Of note is the smaller magnitude of the effect of the practice environment on intention to leave as opposed to its effect on the other outcomes. This finding is consistent with Aiken et al. (2008) who reported that the likelihood of being dissatisfied or burned out was 25% lower for nurses in better practice environments (as compared to mixed or comparing mixed to poor), while the likelihood of intending to leave was only 13% lower in those environments, suggesting that practice environments principal influence is on response to the job (i.e., dissatisfaction and burnout) rather than decisions to change jobs.

Two limitations of the study should be noted. First, this is a cross-sectional study and cannot establish causality. Second, major military developments have occurred since these data were collected. Large-scale deployments to Afghanistan in support of Operation Enduring Freedom (preceding the war in Iraq) were just beginning as data collection was ending. It is unclear how the deployments of nursing and other hospital staff and the subsequent backfill with Army reservists may have affected work environments during this turbulent time. However, the current study provides valuable insight into the practice environments in Army hospitals at a relatively stable time, and provides baseline data for researchers interested in longitudinal comparisons. The time lag between data collection and publication, while unfortunate, was not

related to study design, data quality, or military developments. We believe the findings remain relevant today as the educational preparation of nurses, advancement processes, and employee structures in Army hospitals have not changed.

Consistent with other research, we found that poor practice environments were highly associated with negative RN work outcomes and quality of care. In this article, the authors present the first system-wide picture of the characteristics of the nurse workforce composition and of the work environment within AMEDD U.S.-based hospitals and their effect on nurses' work outcomes and ratings of care quality. Future researchers could replicate this study with a contemporary sample and include patient outcomes data. A contemporary sample would need to account for timing of deployments as well as the addition of Army reserve nurses to the complement of staff nurses.

Acknowledgments

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FIGURE 1.
Locations of Army Medical Department Hospitals Included in the Study.

Table 1

Nurse Characteristics

	Full Set (*n* = 955)		Military		Civilian		
	n	*%*	*n*	*%*	*n*	*%*	*p*
Civilian	598	63					
Female	787	82	238	69	539	90	<.01
Married	613	64	214	63	389	66	n.s.
Caucasian	613	64	223	65	385	64	n.s.
BSN prepared	633	66	337	98	289	48	<.01
Children at home	451	47	139	41	308	52	<.01

	Full Set (*n* = 955)		Military		Civilian		
	M	*SD*	*M*	*SD*	*M*	*SD*	*p*
Age	39.64	11.23	31.23	7.70	44.38	10.07	<.01
Years as RN	11.00	10.55	4.82	6.36	14.45	10.77	<.01

BSN, Bachelor of Science in Nursing; RN, registered nurse.

Table 2

PES–NWI Scores

Subscale	Full Set (*n* = 955)		Military		Civilian		
	M	*SD*	*M*	*SD*	*M*	*SD*	*p*
Nurse Participation in Hospital Affairs	2.52	.62	2.72	.57	2.40	.62	<.01
Nursing Foundations for Quality Care	2.85	.54	2.90	.48	2.82	.57	.04
Nurse Manager Ability and Support	2.57	.88	2.58	.83	2.57	.91	n.s.
Staffing and Resource Adequacy	2.61	.74	2.55	.74	2.64	.75	n.s.
Collegial Nurse–Physician Relationship	2.99	.70	2.99	.71	3.00	.69	n.s.
Composite	2.71	.56	2.75	.54	2.68	.57	n.s.

PES-NWI, Practice Environment Scale of the Nursing Work Index.

Table 3

Work Outcomes and Quality Ratings

	All (*n* = 955)		Military		Civilian		
	n	*%*	*n*	*%*	*n*	*%*	*p*
RN work outcomes							
Dissatisfied with current job	253	27	101	30	148	25	n.s.
High emotional exhaustion	290	30	130	40	155	28	<.01
Intends to leave	320	34	117	34	193	33	n.s.
Fair/poor quality of unit-level care	149	16	62	18	85	14	n.s.

RN, registered nurse.

Table 4

Robust Logistic Regression Odds Ratios Indicating the Effects of Different Nurse and Organizational Characteristics on Job Dissatisfaction, High Emotional Exhaustion, Intent to Leave, and Fair/Poor Quality of Care

	Job Dissatisfaction, Model n = 748	High Emotional Exhaustion, Model n = 812	Intent to Leave, Model n = 857	Fair/Poor Quality of Care, Model n = 858
Female	1.17	.92	1.04	.83
BSN	1.81[**]	1.97[**]	1.44[*]	1.35
Caucasian	1.28	1.53[*]	.90	.94[*]
Nursing experience	1.01	1.01	1.00	.99
Military nurse	1.11	1.50	.91	1.13
Staffing				
Patients per nurse	1.03	1.02	.99	1.01
RN % of nursing staff	.89	.78	.66	.39
Practice environment				
Favorable (as reference)	1.00	1.00	1.00	1.00
Mixed	3.12[**]	3.76[**]	1.71[*]	2.18[*]
Unfavorable	13.75[**]	12.70[**]	3.03[**]	10.66[**]
Constant	−3.34	−3.35	−1.22	−2.77
C statistics	.774	.763	.630	.749
r^2 (pseudo)	.167	.157	.038	.125

BSN, Bachelor of Science in Nursing; RN, registered nurse.

[*] $p \leq .05$,

[**] $p \leq .01$; sample sizes vary for each model due to missing data.