



Published in final edited form as:

Res Nurs Health. 2010 August ; 33(4): 288–298. doi:10.1002/nur.20383.

Nurse Burnout and Quality of Care: Cross-National Investigation in Six Countries

Lusine Poghosyan^{1,*}, Sean P. Clarke^{2,†}, Mary Finlayson^{3,‡}, and Linda H. Aiken^{4,§}

¹Bouvé College of Health Sciences, School of Nursing, Northeastern University, 407C Robinson Hall, 360 Huntington Avenue, Boston, MA 02115-5000 ²Lawrence S. Bloomberg Faculty of Nursing, University of Toronto, University Health Network, Peter Munk Cardiac Centre Toronto General Hospital, Toronto, ON, Canada ³School of Nursing, University of Auckland, Auckland, New Zealand ⁴Center for Health Outcomes and Policy Research, School of Nursing, University of Pennsylvania, Philadelphia, PA

Abstract

We explored the relationship between nurse burnout and ratings of quality of care in 53,846 nurses from six countries. In this secondary analysis, we used data from the International Hospital Outcomes Study; data were collected from 1998 to 2005. The Maslach Burnout Inventory and a single-item reflecting nurse-rated quality of care were used in multiple logistic regression modeling to investigate the association between nurse burnout and nurse-rated quality of care. Across countries, higher levels of burnout were associated with lower ratings of the quality of care independent of nurses' ratings of practice environments. These findings suggest that reducing nurse burnout may be an effective strategy for improving nurse-rated quality of care in hospitals.

Keywords

quality care; burnout; nurse practice environments

Nurses practice in complex organizational settings with multiple and sometimes conflicting missions. The intensity of nursing care is increasing in hospitals internationally as the length of stay is reduced to contain rising costs (Aiken et al., 2001; Norrish & Rundall, 2001). These factors increase work burden on nurses, predispose them to negative health outcomes, and may ultimately influence their performance and the quality of care (Aiken, Clarke, & Sloane, 2002; Gunnarsdóttir, Clarke, Rafferty, & Nutbeam, 2009).

Burnout has been conceptualized as a psychological syndrome comprising emotional exhaustion, a tendency to depersonalize client encounters, and a reduced sense of personal accomplishment (Maslach, 1982). Burnout influences the job performance of the professionals who work with other people in challenging situations (Freudenberger, 1974; Freudenberger & Richelson, 1980). Burnout undermines the care and professional attention

© 2010 Wiley Periodicals, Inc.

Correspondence to: Lusine Poghosyan.

* Assistant Professor of Nursing and Public Health.

† Royal Bank of Canada Chair in Cardiovascular Nursing Research.

‡ Associate Professor.

§ The Claire M. Fagin Leadership Professor of Nursing; Professor of Sociology; Director, Center for Health Outcomes and Policy Research.

given to clients of human service professionals such as teachers, police officers, lawyers, nurses, and others (Leiter, Harvie, & Frizzell, 1998; Maslach, 1982; Vahey, Aiken, Sloane, Clarke, & Vargas, 2004). It appears to be a common phenomenon among nurses worldwide. Evidence indicates high proportions of nurses in North America, Europe, and Asia experience burnout (Aiken et al., 2001; Perrewe et al., 2002; Poghosyan, Aiken, & Sloane, 2009). Not surprisingly, a number of investigators have shown that job turnover is significantly higher among nurses experiencing burnout (Hasselhorn, Tackenberg, & Müller, 2003; Lake, 1998; Larrabee et al., 2003).

Little research has been done to probe the relationship between nurse burnout and quality of patient care even though well-known authors in the burnout literature have long suggested that the syndrome affects job performance (Maslach & Jackson, 1985). Because burnout is characterized by feelings of emotional depletion, distancing from patients, and feelings of ineffectiveness at work, it is quite plausible that burnout reduces the likelihood of engaged and proficient care. Although some investigators have demonstrated an association between nurse burnout and lower patient satisfaction (Leiter et al., 1998; Vahey et al., 2004), this association has not been shown with other quality of care indicators, nor have the potential mechanisms that may be involved been probed. Some researchers found that burnout mediates the relationship between nurse practice environments and nurse reported quality of care (Van Bogaert, Meulemans, Clarke, Vermeyen, & Van de Heyning, 2009). In another study, researchers found that 30-day mortality rates, another indicator of quality care, was associated with nurses' reports of quality of care and nurse burnout (Tourangeau et al., 2007). An intriguing question remains, however, regarding whether burnout and poor quality of care are causally linked, and if so how.

Although nurses who experience burnout may show less ability or willingness to deliver high quality care, it is also possible that working in environments where quality of care is low may lead to emotional distress and disengagement. Burnout and nurses' perceptions of poor quality of care might also be correlated with each other because both variables reflect nurses' negative assessments of or dissatisfaction with their work situations.

An alternate explanation is that both quality of care and burnout are linked to the same underlying working conditions. For instance, evidence suggests that poorer patient outcomes are associated with higher hospital patient to nurse ratios (Clarke & Donaldson, 2008; Kane, Shamliyan, Mueller, Duval, & Wilt, 2007). Poor practice environments—in the form of low perceived support from front-line and executive-level managers, low levels of human and material resources for providing care, limited resources for quality improvement and staff development, and poor relationships between nursing and other disciplines—have also been linked to a variety of poor patient and nurse outcomes (Aiken, Clarke, & Sloane, 2002; Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Stone, Du, & Gershon, 2007). Findings from a number of studies suggest that patient outcomes and nurse burnout are both strongly associated with low staffing levels and poor practice environments (Aiken et al., 2008; Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Laschinger & Leiter, 2006).

In the study reported here, we used survey data collected from 53,846 nurses in six countries—the U.S., Canada, U.K., Germany, New Zealand, and Japan—to investigate the association between nurse burnout and nurse-rated quality of care. The instruments and questionnaires in each of these surveys included measures of many variables hypothesized to be involved in the relationship between burnout and perceptions of quality of care.

The conceptual frameworks that guided selection of the variables in these analyses included those of Aiken, Sochalski, and Lake (1997), Lake (1999), and Cordes and Dougherty (1993). These frameworks demonstrate that both organizational (e.g., practice environments)

and individual factors (e.g., sex) influence burnout levels and that burnout may contribute to negative consequences such as poor job performance. In this analysis, burnout measures were examined as potential correlates of quality of care measures before and after controlling for a number of potential confounders such as job dissatisfaction. Job dissatisfaction, as a measure of negative feelings about one's job, could confound both burnout and quality of care ratings. Other background nurse characteristics that describe nursing practice such as years worked in the hospital, hours worked per week, and number of patients cared for during the last shift were also included in the analytical models. Nurses' practice environment in hospitals was included to rule out the possibility that burnout and quality are related only because they are both reflections of the quality of the work environment.

METHODS

Design

In this study, we conducted a secondary analysis of cross-sectional data collected in the International Hospital Outcomes Study (IHOS) and subsequent replications. The IHOS was completed between 1998 and 1999 in four countries—the U.S., Canada, U.K. (Scotland and England), and Germany (Aiken, Clarke, & Sloane, 2002). It was replicated in New Zealand in 2001 (Finlayson, Aiken, & Nakarada-Kordic, 2007), and in Japan in 2005 (Kanai-Pak, Aiken, Sloane, & Poghosyan, 2008). In the parent study, the investigators examined the influence of nurse staffing and practice environment characteristics on nurse outcomes (e.g., nurse burnout and job dissatisfaction) and patient outcomes (e.g., patient mortality within 30 days of hospital admission). In the secondary analysis reported here we examined the relationship between two variables treated as dependent variables in the parent study—burnout and nurse-rated quality of care.

Sampling frames for hospital nurses in the IHOS differed slightly across countries. The approaches were designed to gather complete data from representative samples of hospitals and hospital nurses for each country or jurisdiction as efficiently as possible. A possible limitation to representative-ness was underrepresentation of smaller hospitals when random samples of nurses were drawn province- or state-wide in the North American jurisdictions, and intentional omission of small hospitals (under 100 beds) when hospitals were the sampling frame (outside the U.S. and Canada).

The U.S. data were gathered from nurses practicing in most hospitals in the state of Pennsylvania. Using a modified Dillman (1978) protocol, questionnaires were mailed to the home addresses of a random sample of 50% of the registered nurses licensed and living in Pennsylvania; the response rate was 52% ($N = 13,152$). The demographic characteristics of the participants were similar to the demographic profiles of Pennsylvania nurses in the 2000 National Sample Survey of Registered Nurses as reported in IHOS (Aiken, Clarke, Sloane, Sochalski, et al., 2002). Hospital nurses were asked to select their employing hospital from a list provided. Sampling strategy allowed targeting nurses practicing in all general hospitals in the state.

In Canada, registered nurses were sampled from lists of licensed nurses in three provinces. Greater information from licensing bodies allowed the samples in Canada to be targeted to hospital nurses. The response rates were 53%, 49%, and 57% in Alberta, British Columbia, and Ontario, respectively. The total Canadian nurse sample was 17,403 nurses; they represented most of the hospitals in all three provinces.

At the time of the study, there were no complete rosters of practicing nurses in the U.K. Specific hospitals were selected for the study, therefore, and nurses were then sampled from

within those hospitals. All 30 hospitals in Scotland were invited to participate, and 27 chose to do so. Fifty percent of nurses in the participating hospitals (4,721 nurses) returned the survey. In the U.K., hospitals that had patient outcomes data available, a requirement to address a specific aim of the IHOS, were chosen to participate based on their geographic location, size, and teaching status. The survey was distributed to nurses involved with direct patient care. Across the 32 hospitals from the U.K., a 49% response rate was obtained (Rafferty et al., 2007).

Hospital selection in Germany was also based on the availability of patient outcomes data (Aiken et al., 2001). Questionnaires were distributed to nurses by nurse managers in a convenience sample of 29 hospitals. Overall, 2,681 German nurses returned completed questionnaires, a 42% response rate.

Twenty-four of the possible 30 hospitals in New Zealand agreed to participate in the IHOS. Surveys were mailed to all nurses employed in these hospitals. The final sample consisted of 4,799 nurses, a response rate of 37% (Finlayson et al., 2007).

Hospitals in Japan were stratified by location, size, and teaching status. A convenience sample of 19 Japanese hospitals participated in the survey in 2005. Nurse managers in each participating hospital unit distributed questionnaires to nurses on their units. The 5,956 nurses who responded to the survey represented a 83.9% response rate (Kanai-Pak et al., 2008).

Sample and Sample Description for This Secondary Analysis

Table 1 displays the characteristics of the 53,846 nurses from the six countries. The mean age of the nurses varied from 29.2 years in Japan to 42.2 years in Canada. The percent of male respondents varied from 2.5% in Canada to 15.4% in Germany. Over one-third of U.S. nurse respondents and 40.4% in New Zealand had attained at least a Bachelor of Science degree in nursing (BSN), while only 8–17% of nurses in other countries held the equivalent of a BSN or higher. Definitions of full-time employment varied across countries, ranging from 35 to 40 hours per week. More than 60% of the nurses in all countries except Canada reported that they were employed full time. In Canada, only 43.4% of the nurses were employed full time.

Table 2 lists the numbers of hospitals and the ranges of nurse respondent numbers per hospital by country. Hospitals from which fewer than 10 nurses responded to the survey were excluded from the inferential analysis so that stable estimates of environmental conditions aggregated to the hospital level could be used as control variables in the analyses. Numbers of nurses from each hospital ranged from 10 to 1,019.

Adaptation of the Instruments

In the parent study, survey instruments written in English were adapted, and where necessary, translated into the language of the country. The resulting target language versions were back-translated by separate translators into English. Each country's research team ensured that language and content were relevant to nurses in that country. After comparing the original and back-translated versions of the instruments, they were pilot-tested to assess the need for further revisions. Revisions primarily involved word choice in questions regarding types of nurses or nursing work, such as the highest education attained in nursing, which varied across countries.

Independent Variable: Burnout

Nurse burnout was the independent variable in this study. In the parent study, it was measured using all three subscales of the Maslach Burnout Inventory (MBI): Emotional Exhaustion (EE), Depersonalization (DP), and Personal Accomplishment (PA). Items on the MBI ask nurses to rate their experience of certain feelings on a 7-point scale, ranging from never experiencing those feelings to having those feelings a few times a week. The EE subscale describes nurses' feelings of psychological depletion due to work burden. It contains nine items such as "I feel emotionally drained by my work." The PA subscale contains eight items that describe beliefs of competence and successful achievement at work, such as "I have accomplished many worthwhile things in this job." Depersonalization is described by Maslach (1982) as a detached and unfeeling response to clients. The 5-item depersonalization (DP) subscale contains items such as "I do not really care what happens to my patients." In their original work, Maslach and Jackson (1981b) demonstrated that the three subscales of the MBI have good psychometric properties, with Cronbach's alphas well above .7. Since its development, the instrument has been widely used to measure burnout among nurses as well as other professionals. High mean scores on EE and DP and low mean scores on PA are suggestive of burnout (Maslach & Jackson, 1981a).

In our previous work, we demonstrated that with minor modifications, the MBI performed similarly among nurses in eight countries (Poghosyan et al., 2009). The 22-item version of the instrument had a similar factor structure, and each of the three subscales demonstrated high estimates of internal consistency, Cronbach's alphas higher than .7, in each of the eight countries, suggesting that the MBI is a useful tool for measuring nurse burnout across a range of countries. We calculated Cronbach's alphas for each MBI subscale. The range of Cronbach's alphas was from .75 to .93 in each of these six countries. We used all three subscales of the MBI to measure nurse burnout in the study reported here.

Dependent Variable: Nurse-Rated Quality of Care

The dependent variable in this study was nurses' reports of quality care. For some time, researchers have considered nurses' independent assessments of the quality of patient care as a useful measure that integrates a variety of relevant dimensions of quality of care (Pearson et al., 2000). Here, a single item was used. It asked nurses to rate patient care on their unit during the last shift they worked using a 4-point scale from excellent to poor. Nurses' perceptions of quality of care on the last shift worked serves as a proxy for quality of care in general; it provides respondents with a specific and recent reference point to minimize recall bias. For the purposes of the analyses reported here, this variable was dichotomized into *excellent* or *good* versus *fair* or *poor* care to differentiate acceptable and unacceptable care and to ease the interpretation of the regression coefficients.

Single-item measures have demonstrated associations with quality indicators and patient outcomes (Pearson et al., 2000; Reschovsky, Reed, Blumenthal, & Landon, 2001) as well as structural (e.g., heavy patient loads) and process indicators (e.g., unfinished clinical care measured by nursing tasks left undone; Sochalski, 2001). Sochalski found that nurses who reported nursing tasks left undone (higher levels of unfinished care) at the end of the shift also reported poor quality of care ($r = -.59, p < .001$).

Control Variables

All models included statistical controls for hospital-level nurse practice environment ratings, measured using the Practice Environment Scale of the Nursing Work Index (PES-NWI) averaged across nurses within the same facilities (Lake, 2002). Individuals know their organizations and can provide information about the organizational structures that either impede or promote their work performance. Aiken, Lake, Sochalski, and Sloane (1997)

demonstrated that by aggregating individual responses of nurses regarding their hospital organization, it is possible to describe the organizational characteristics of the hospitals. Individual responses are reliable and valid measures to describe the organization (Aiken, Lake, et al., 1997). In this study, hospital-level averages, reflected as mean scores of the PES-NWI subscales, were calculated by aggregating individual nurse responses at the hospital level.

The PES-NWI contains five subscales: Nurse Participation in Hospital Affairs (9 items); Nursing Foundations for Quality Care (10 items); Nurse Manager Ability, Leadership, and Support for Nurses (5 items); Staffing and Resource Adequacy (4 items); and Collegial Nurse–Physician Relations (3 items). After reviewing 7 different instruments and 54 studies, Lake (2007) concluded that the PES-NWI is the most useful instrument in terms of theoretical relevance, content, length, and dissemination for measuring nurse practice environments.

The PES-NWI has good psychometric properties (Lake, 2002). Its subscales exhibited high reliability with Cronbach's alphas ranging from .88 to .98 in U.S. samples (Lake & Friese, 2006). The instrument was capable of differentiating the hospitals with better organizations from the hospitals with poorer organizations thus demonstrating evidence supporting the validity of the PES-NWI subscales. We investigated the internal consistencies of PES-NWI subscales for each country. The subscales demonstrated high internal consistency. Cronbach's alphas ranged from .72 to .85.

International adaptations of the PES-NWI have demonstrated stable factor structures and high internal consistencies for subscales in a variety of studies using data produced from IHOS (Rafferty et al., 2007) and from similar replications (Schubert, Glass, Clarke, Schaffert-Witvliet, & De Geest, 2007; Van Bogaert, Clarke, Vermeyen, Meulemans, & Van de Heyning, 2009). In a study conducted among Chinese nurses, Cronbach's alpha for the PES-NWI scale was .9 (Chiang & Lin, 2009). Prior researchers have found that lower mean scores on PES-NWI subscales are associated with an increased likelihood of finding negative nurse outcomes such as burnout and job dissatisfaction (Friese, 2005) as well as nurses' lower ratings of quality of care (Aiken et al., 2008).

Selection of the control variables was based on prior research and the conceptual frameworks used in this study. Models also included other control variables such as age, sex, years worked at the hospital, hours worked per week, the number of patients the nurse reported caring for on his/her last shift (a staffing/workload measure), and job dissatisfaction. The number of hours worked each shift and heavy workloads contribute to both burnout and quality of care (Aiken, Clarke, Sloane, Sochalski, et al., 2002; Rogers, Hwang, Scott, Aiken, & Dinges, 2004). Job dissatisfaction was measured by asking nurses to report their level of satisfaction with their current position, ranging from very satisfied to very dissatisfied. These control variables were included to rule out competing explanations for any burnout–quality of care associations, as previously discussed.

Data Analysis

The Statistical Package for the Social Sciences (SPSS version 16.0, SPSS, Inc., Chicago, IL) and Stata Statistical Software (Release 10, StataCorp., College Station, TX) were used for this data analysis. Descriptive statistics were used to depict characteristics of nurses in each country: frequencies were used for categorical variables, and means and standard deviations were used for the continuous variables. Burnout scores were calculated using the guidelines in the MBI manual (Maslach & Jackson, 1981a); nurse-level mean scores on each subscale were computed. One-way analyses of variances (ANOVAs) were carried out to examine differences in mean emotional exhaustion, personal accomplishment, and depersonalization

scores for nurses who reported quality of care as fair or poor compared to nurses who reported quality of care as good or excellent.

Logistic regression models were built separately for each country to analyze the relationship between nurse burnout and nurse-rated quality of care. This was done by calculating the odds of nurses' reporting fair/poor quality of care as a function of a one unit increase in their scores on each of the MBI subscales. Models were first computed predicting nurse-rated quality care with burnout scores alone. Subsequently, control variables were added and changes in parameter estimates and their statistical significance were observed. The final models controlled for age, sex, years worked at the hospital, hours worked per week, the number of patients the nurse reported caring for on his/her last shift, job dissatisfaction, and hospital-level ratings on the five nurse practice environment dimensions.

Multicollinearity in the data occurs when independent variables are correlated to some degree (Fox & Monette, 1992). Tolerance and variance-inflation factor (VIF) statistics were investigated to demonstrate how the collinearity among independent variables damages the precision of the estimates. Tolerance and VIF statistics demonstrated that multicollinearity is not a problem in these models. Most values for the tolerance were higher than .7 (if smaller than .2 or closer to "0" multicollinearity exists) demonstrating that the predictor variables in the models do not contain redundant information. VIF statistics had smaller values (larger than 4 indicates multi-collinearity), thus confirming that multicollinearity is not a problem in the models (Fox & Monette). To account for the clustering of nurses within hospitals, Huber–White ("robust") estimates of the standard errors of regression parameters were calculated (STATA 10; Huber, 1967).

RESULTS

Descriptive Cross-National Findings

Table 3 provides nurse-level mean MBI subscale scores for the six countries. Nurses in Japan had a profile suggestive of the highest burnout levels of any of the countries. They had the highest mean scores on EE and DP, and the lowest mean scores on PA. As a group, nurses from Germany had the lowest burnout levels based on all three MBI subscales. The highest mean EE score was found in Japanese nurses ($M = 29$), with the next highest levels observed in U.S. nurses ($M = 25$). Nurses from Canada, U.K., and New Zealand scored very similarly on the three MBI subscales; their levels were suggestive of lower burnout, overall, than nurses in Japan and the U.S. but higher burnout than nurses in Germany. The dependent variable, nurse-rated quality of care, varied across countries (Table 3). Nearly 80% of nurses in Japan perceived the quality of care during the last shift worked as fair or poor compared to only 9.4% of nurses in New Zealand. In the U.S., Canada, and U.K., 19%, 14%, and 13% of the nurses, respectively, reported quality of care as fair/poor. The second highest level of nurse-rated quality was reported in Germany where 30% of nurses reported quality of care as fair or poor. The differences were not statistically tested given the various cultural factors that may affect nurses' reports of burnout and quality of care. This study was focused on the relationship between the independent and dependent variable rather than their levels.

Table 4 provides the MBI subscale scores for nurses who reported excellent/good quality of care and those who reported fair/poor quality of care. Differences in mean scores were statistically significant for all three MBI subscales in all countries with the exception of Canada, where no differences on PA or DP subscales in relation to quality of care ratings were identified. Later, in the model building process, we only included nurses from hospitals from which at least 10 nurses responded to the survey, which improved the score distribution of PA and DP subscales in Canada, and the relationship between independent and dependent variables of the study.

Burnout and Nurse-Rated Quality of Care

Table 5 displays odds ratios from unadjusted as well as adjusted models and 95% confidence intervals for odds ratios from the final fully adjusted models predicting the nurses' ratings of quality of care from three dimensions of burnout. Emotional exhaustion was a significant predictor of ratings of fair/poor care quality in unadjusted models across all countries. In these models, every unit increase in the EE score was associated with a 4–8% rise in the odds of reporting fair/poor quality of care. The effects were similar across countries. In adjusted models, EE remained a significant, albeit slightly weaker, predictor of fair/poor quality of care reports for nurses in all countries. For example, among U.S. nurses, every unit increase in the EE score was associated with a 5% increase in the odds of reporting fair/poor quality care, keeping other variables in the model constant.

Higher depersonalization subscale scores were also a significant predictor of nurses' reports of fair/poor quality care. For example, for every unit increase in the DP score in the U.K., the odds of reporting fair/poor quality care increased by 10%. In the adjusted model, the odds of reporting fair/poor quality care by nurses in the U.K. increased by 6% with each unit increase on the DP subscale. In the fully adjusted models, across countries the associations between DP and nurse-rated quality of care again weakened slightly but remained statistically significant.

The Personal Accomplishment dimension of burnout was significantly associated with fair/poor quality care ratings in all countries. In unadjusted models, the odds of reporting poor quality care decreased by about 5% with each unit increase in the personal accomplishment score. After controlling for other factors in the fully adjusted models, the estimates for PA were unchanged.

DISCUSSION

In this secondary analysis of cross-national data, the investigators examined the association between nurse burnout and nurse-rated quality of care in hospitals across six industrialized countries. We found that high nurse burnout levels were significantly associated with nurses' appraisals of quality of care independent of nurse characteristics, working conditions, and other related variables. Cross-national comparative research contributes significantly to the body of knowledge about a specific country as well as about global challenges facing the nursing profession. The range and representativeness of the cross-national samples and the large site specific and overall sample sizes are unique strengths of this study.

In this study, we expected to see nurse burnout affecting the nurse-rated quality of patient care. Close interpersonal contact with patients and complex practice environments may predispose nurses to burnout and subsequently impact their job performance and quality of care. Results of this study join others in the literature suggesting nurses around the world face similar issues despite cultural, economic, and social differences as well as variations in healthcare systems. Providing safe and high quality care in a context of nurse burnout and severe nursing shortage often is very challenging. Developing, testing, and implementing intervention programs to reduce burnout may produce a variety of beneficial effects, including keeping nurses in clinical positions, and maintaining or raising quality of care.

Study Limitations

In this study, despite the use of similar research protocols and the same instruments, there were variations in the data collection processes across countries. For instance, in some sites, nurses were surveyed at their employing hospitals; in others surveys were mailed to nurses' homes. Because it is unclear how such differences in survey approaches might have

influenced nurses' responses, such variations pose a limitation for the study findings. Additionally, the variables examined were limited to those collected in the original studies. This is an important, albeit universal, limitation of secondary analyses. To cite only one example, nursing education could not be used as a control variable in the regression analyses because not all sites collected comparable data on this variable.

Several limitations in this study relate to the measurement of quality of care. Although global ratings of quality of care are convenient, in the future, researchers should consider measuring quality of nursing care using multidimensional scales and measures that capture more aspects of the quality of nursing care. In addition, we relied on nurses' reports of quality of care, with all of its potential biases and limitations. In future research, patient outcomes data will need to be collected from multiple sources including discharge abstracts to represent quality care rather than relying solely on nurses' reports. Although nurse-rated quality of care was analyzed at the individual nurse level, it might be argued that it is more properly operationalized as a unit or a hospital characteristic. Alternatives for future studies could include using quality of care in unit and/or hospital level in multilevel models.

The cross-sectional design and absence of data about processes of care preclude firm conclusions about causal mechanisms connecting burnout and nurse-rated quality of care. Future research should focus on investigating whether burnout directly affects patient care, for instance, by increasing the occurrence of errors or adverse events, or decreasing the provision of certain types of care.

Finally, some questions can be raised regarding the generalizability of findings, especially because the data analyzed here were collected over several years. The age of the data varied across countries as did the control variables that reflect a particular vision of professional nursing practice and the factors supporting it. However, there are reasons to have considerable confidence in the robustness of the association between ratings of quality of care and burnout. These reasons include the consistent patterns in the results despite the data having been collected at a variety of time points in distinct and rapidly evolving healthcare systems around the world. The reasons also include our ability to control for a variety of different types of variables, including those measured by the PES-NWI that has demonstrated a stable factor structures across cultures. Nonetheless, continued tracking of this association over time and across countries through replications of this work and inclusion of measures reflective of different perspectives on what constitutes an environment supportive of professional practice would both be advisable.

Conclusion

Across six countries, higher levels of nurse burnout were significantly associated with a greater likelihood of nurses' rating quality of care as fair/poor. This relationship did not appear to be an artifact of associations between these variables and either nursing practice environments or other job-related characteristics; it therefore deserves further discussion and study. Burnout appears to be an important indicator for both human resource and practice leaders at all levels in hospitals to track quality of care issues. Reducing nurse burnout could be a highly effective strategy for improving nurse-rated quality of care particularly in the contexts of a deepening nurse shortage and increasing pressure to address problems with safety and consistency of care in health systems around the world.

Acknowledgments

The original data collection for the International Hospital Outcomes Study (IHOS) was supported by the National Institute for Nursing Research (R01NR04513 and P30NR05043, Linda Aiken, principal investigator); the Commonwealth Fund; the Agency for Healthcare Research and Quality; the Alberta Heritage Foundation for

Medical Research; the British Columbia Health Research Foundation; the Federal Ministry of Education and Research (Germany); the Nuffield Provincial Hospitals Trust, London; the Baxter Foundation; the Health Research Council of New Zealand; the International Research Grant by Pfizer Health Research Foundation; and the Japan Society of Promotion of Science. We thank Timothy Cheney for his assistance with the data analysis.

REFERENCES

- Aiken LH, Clarke SP, Sloane DM. Hospital staffing, organization, and quality of care: Cross-national findings. *International Journal for Quality in Health Care* 2002;14:5–13. [PubMed: 11871630]
- Aiken LH, Clarke SP, Sloane DM, Lake ET, Cheney T. Effects of hospital care environment on patient mortality and nurse outcomes. *Journal of Nursing Administration* 2008;38:223–229. [PubMed: 18469615]
- Aiken LH, Clarke SP, Sloane DM, Sochalski JA, Busse R, Clarke H, et al. Nurses' reports on hospital care in five countries. *Health Affairs* 2001;20(3):43–53. [PubMed: 11585181]
- Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *Journal of American Medical Association* 2002;288(16):1987–1993.
- Aiken LH, Lake ET, Sochalski J, Sloane DM. Design of an outcomes study of the organization of hospital AIDS care. *Research in the Sociology of Health Care* 1997;14:3–26.
- Aiken LH, Sochalski J, Lake ET. Studying outcomes of organizational change in health services. *Medical Care* 1997;35:NS6–NS18. [PubMed: 9366875]
- Chiang HY, Lin SY. Psychometric testing of the Chinese version of nursing practice environment scale. *Journal of Clinical Nursing* 2009;18(6):919–929. [PubMed: 19017371]
- Clarke, SP.; Donaldson, NE. Nurse staffing and patient care quality and safety. In: Hughes, RG., editor. *Patient safety and quality: An evidence-based handbook for nurses*. Vol. 2. Rockville, MD: Agency for Healthcare Research and Quality; 2008. p. 2-11-12-135.
- Cordes CL, Dougherty TW. A review and an integration of research on job burnout. *Academy of Management Review* 1993;18(4):621–656.
- Dillman, DA. *Mail and telephone surveys: The total design method*. New York: John Wiley; 1978.
- Finlayson M, Aiken LH, Nakarada-Kordic I. New Zealand nurses' reports on hospital care: International comparisons. *Nursing Praxis in New Zealand* 2007;23(1):17–28.
- Fox J, Monette G. Generalized collinearity diagnostics. *Journal of the American Statistical Association* 1992;87(417):178–183.
- Freudenberger HJ. Staff burnout. *Journal of Social Issues* 1974;30(1):159–165.
- Freudenberger, HJ.; Richelson, GI. *Burnout: The high cost of high achievement*. New York: Anchor Press, Doubleday & Company, Inc.; 1980.
- Friese CR. Nurse practice environments and outcomes: Implications for oncology nursing. *Oncology Nursing Forum* 2005;32(4):765–772. [PubMed: 15990906]
- Gunnarsdóttir S, Clarke SP, Rafferty AM, Nutbeam D. Front-line management, staffing and nurse-doctor relationships as predictors of nurse and patient outcomes: A survey of Icelandic hospital nurses. *International Journal of Nursing Studies* 2009;46(7):920–927. [PubMed: 17229425]
- Hasselhorn, HM.; Tackenberg, P.; Müller, BH. Working conditions and intent to leave the profession among nursing staff in Europe: Burnout in the nursing profession in Europe. 2003 [retrieved October 6, 2006]. http://www.arbeitsfaehigkeit.uni-wuppertal.de/picture/upload/file/Hasselhorn_2003.pdf
- Huber, PJ. The behaviour of maximum likelihood estimates under non-standard conditions; *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability*; Berkeley: University of California Press; 1967. p. 221-233.
- Kanai-Pak M, Aiken LH, Sloane DM, Poghosyan L. Poor work environments and nurse inexperience are associated with burnout, job dissatisfaction, and quality deficits in Japanese hospitals. *Journal of Clinical Nursing* 2008;17(24):3324–3329. [PubMed: 19146591]
- Kane RL, Shamliyan TA, Mueller C, Duval S, Wilt TJ. The association of registered nurse staffing levels and patient outcomes systematic review and meta-analysis. *Medical Care* 2007;45(12):1195–1204. [PubMed: 18007170]

- Lake ET. Advances in understanding and predicting nurse turnover. *Research in the Sociology of Health Care* 1998;15:147–171.
- Lake, ET. Unpublished Dissertation. Philadelphia: University of Pennsylvania; 1999. The organization of the hospital nursing.
- Lake ET. Development of the Practice Environment Scale of the Nursing Work Index. *Research in Nursing & Health* 2002;25(3):176–188. [PubMed: 12015780]
- Lake ET. The nursing practice environment: Measurement and evidence. *Medical Care Research & Review* 2007;64:104S–122S. [PubMed: 17406014]
- Lake ET, Friese CR. Variations in nursing practice environments: Relation to staffing and hospital characteristics. *Nursing Research* 2006;55(1):1–9. [PubMed: 16439923]
- Larrabee J, Janney M, Ostrow CL, Withrow M, Hobbs GR, Burant C. Predicting registered nurse job satisfaction and intent to leave. *Journal of Nursing Administration* 2003;33(5):271–283. [PubMed: 12792282]
- Laschinger HS, Leiter MP. The impact of nursing work environments on patient safety outcomes: The mediating role of burnout engagement. *Journal of Nursing Administration* 2006;36(5):259–267. [PubMed: 16705307]
- Leiter MP, Harvie P, Frizzell C. The correspondence of patient satisfaction and nurse burnout. *Social Science & Medicine* 1998;47(10):1611–1617. [PubMed: 9823056]
- Maslach, C. *Burnout: The cost of caring*. Englewood Cliffs, NJ: Prentice Hall; 1982.
- Maslach, C.; Jackson, SE. *Maslach Burnout Inventory*. 2nd ed.. Consulting Psychologists Press: Palo Alto, CA; 1981a.
- Maslach C, Jackson SE. The measurement of experienced burnout. *Journal of Occupational Behaviour* 1981b;2(1):99–113.
- Maslach C, Jackson SE. The role of sex and family variables in burnout. *Sex Roles* 1985;12(7/8):837–851.
- Norrish BR, Rundall TG. Hospital restructuring and the work of registered nurses. *The Milbank Quarterly* 2001;79(1):55–79. [PubMed: 11286096]
- Pearson ML, Lee JL, Chang BL, Elliott M, Kahn KL, Rubenstein LV. Structured implicit review: A new method for monitoring nursing care quality. *Medical Care* 2000;38(11):1074–1091. [PubMed: 11078049]
- Perrewe PL, Hochwarter WA, Rossi AM, Wallace A, Maignan I, Castro SL, et al. Are work stress relationships universal? A nine-region examination of stressors, general self-efficacy, and burnout. *Journal of International Management* 2002;8(4):163–187.
- Poghosyan L, Aiken LH, Sloane DM. Factor structure of the Maslach Burnout Inventory: An analysis of data from large scale cross-sectional surveys of nurses from eight countries. *International Journal of Nursing Studies* 2009;46(7):894–902. [PubMed: 19362309]
- Rafferty AM, Clarke SP, Coles J, Ball J, James P, McKee M, et al. Outcomes of variation in hospital nurse staffing in English hospitals: Cross-sectional analysis of survey data and discharge records. *International Journal of Nursing Studies* 2007;44(2):175–182. [PubMed: 17064706]
- Reschovsky J, Reed M, Blumenthal D, Landon B. Physicians' assessments of their ability to provide high-quality care in a changing health care system. *Medical Care* 2001;39(3):254–269. [PubMed: 11242320]
- Rogers AE, Hwang W, Scott LD, Aiken LH, Dinges DF. The working hours of hospital staff nurses and patient safety. *Health Affairs* 2004;23(4):202–212. [PubMed: 15318582]
- Schubert M, Glass TR, Clarke SP, Schaffert-Witvliet B, De Geest S. Validation of the base extent of rationing of Nursing Care Instrument. *Nursing Research* 2007;56(6):416–424. [PubMed: 18004188]
- Sochalski J. Quality of care, nurse staffing, and patient outcomes. *Policy, Politics, & Nursing Practice* 2001;2(1):9–18.
- Stone P, Du Y, Gershon R. Organizational climate and occupational health outcomes in hospital nurses. *Journal of Occupational & Environmental Medicine* 2007;49(1):50–58. [PubMed: 17215713]

- Tourangeau AE, Doran DM, Hall LM, O'Brien Pallas L, Pringle D, Tu JV, et al. Impact of hospital nursing care on 30-day mortality for acute medical patients. *Journal of Advanced Nursing* 2007;57(1):32–44. [PubMed: 17184372]
- Vahey DC, Aiken LH, Sloane DM, Clarke SP, Vargas D. Nurse burnout and patient satisfaction. *Medical Care* 2004;42(2):57–66.
- Van Bogaert P, Clarke SP, Vermeyen K, Meulemans H, Van de Heyning P. Practice environments and their associations with nurse-reported outcomes in Belgian hospitals: Development and preliminary validation of a Dutch adaptation of the Revised Nursing Work Index. *International Journal of Nursing Studies* 2009;46(1):55–65.
- Van Bogaert P, Meulemans H, Clarke SP, Vermeyen K, Van de Heyning P. Hospital nurse practice environment, burnout, job outcomes and quality of care: Test of a structural equation model. *Journal of Advanced Nursing* 2009;65(10):2175–2185. [PubMed: 20568322]

Table 1

Characteristics of Nurse Respondents Across Six Countries (N = 53,846)

Variables	U.S. (n = 13,152)	Canada (n = 17,403)	U.K. (n = 9,855)	Germany (n = 2,681)	New Zealand (n = 4,799)	Japan (n = 5,956)
Age (years)						
Mean	39.9	42.2	35.3	35.3	40.7	29.2
SD	9.7	8.9	9.0	8.9	9.9	7.4
Years in nursing						
Mean	14.2	17.7	10.9	12.5	15.5	7.3
SD	9.9	9.2	8.4	8.9	9.8	7.2
Years in hospital						
Mean	10.4	12.3	7.6	9.4	8.3	6.0
SD	8.2	7.8	6.5	8.0	7.9	6.6
Years in unit						
Mean	7.3	8.5	5.0	6.7	4.9	2.8
SD	6.5	6.7	4.7	6.5	5.6	2.7
Gender (%)						
Male	6.2	2.5	8.1	15.4	6.7	3.9
Female	93.8	97.5	91.9	84.6	93.3	94.4
BSN or higher nursing degree						
Full time ^a (%)	64.1	43.4	68.8	71.8	92.2	95.5

n, number of nurses; SD, standard deviation; BSN, Bachelor of Science in Nursing.

Note. The analysis is based on the total sample.

^aNurses self-identified as full time employed. Full time employment varies by country from 35 to 40 hours per week.

Table 2

Participating Hospitals and Nurses by Country

Country	Hospitals	Nurses	Range of Nurse Responses per Hospital	
			Minimum	Maximum
United States	198	13,152	10	317
Canada	293	16,844	10	1,019
United Kingdom	60	9,851	42	455
Germany	27	2,676	36	237
New Zealand	19	4,230	28	547
Japan	19	5,956	78	730
Total	616	52,709		

Note. Hospitals from which fewer than 10 nurses responded to the survey were excluded from the multivariable analysis and are not included in this table.

Table 3

Nurse Burnout and Fair/Poor Quality of Care Reports Across Six Countries

	U.S.	Canada	U.K.	Germany	New Zealand	Japan
Burnout dimensions						
Emotional exhaustion	24.5 (12.1)	22.5 (11.3)	21.8 (11.0)	18.4 (10.0)	22.2 (11.2)	29.4 (11.6)
Depersonalization	6.9 (6.1)	6.2 (5.6)	6.8 (5.8)	5.2 (4.7)	6.0 (5.8)	8.1 (5.8)
Personal accomplishment	37.5 (7.2)	37.4 (7.1)	36.0 (7.3)	37.5 (7.5)	38.2 (6.8)	24.6 (8.4)
Quality of care fair/poor ^a (%)	18.8	14.4	12.8	30.7	9.4	79.9
Nurse sample	13,152	16,844	9,851	2,676	4,230	5,956

Note. Higher mean scores on the Emotional Exhaustion (EE) and Depersonalization (DP) subscales and lower mean scores on the Personal Accomplishment (PA) subscale demonstrate evidence of high burnout. Range of the EE mean score is 0–54; PA mean score 0–48; and DP mean score 0–30. The values are mean (standard deviation).

^aPercent of nurses reporting fair/poor quality of care.

Table 4
Differences on Burnout Dimension Scores Between Nurses Reporting Excellent/Good or Fair/Poor Quality of Care Across Six Countries

	Emotional exhaustion			Personal accomplishment			Depersonalization		
	M (SD)	N	p-Value	M (SD)	N	p-Value	M (SD)	N	p-Value
U.S.			<.001			<.001			<.001
Excellent/good	22.59 (11.62)	9,312		38.25 (6.96)	8,945		6.06 (5.57)	9,777	
Fair/poor	32.58 (10.91)	2,135		34.31 (7.42)	2,109		10.44 (6.85)	2,264	
Canada			<.001			.796			.19
Excellent/good	17.95 (9.51)	13,991		37.35 (7.13)	13,207		6.19 (5.63)	13,959	
Fair/poor	26.14 (9.93)	2,375		37.39 (7.14)	2,225		6.02 (5.53)	2,361	
U.K.			<.001			<.001			<.001
Excellent/good	20.74 (10.72)	8,312		36.34 (7.13)	7,451		6.30 (5.56)	7,975	
Fair/poor	28.97 (10.78)	1,218		33.56 (7.71)	1,102		10.00 (6.84)	1,167	
Germany			<.001			<.001			<.001
Excellent/good	14.72 (8.54)	1,761		46.79 (7.02)	1,489		9.36 (4.04)	1,649	
Fair/poor	20.87 (9.54)	781		42.86 (7.85)	695		11.86 (5.29)	749	
New Zealand			<.001			<.001			<.001
Excellent/good	21.27 (10.83)	3,526		38.46 (6.63)	3,130		5.64 (5.44)	3,360	
Fair/poor	30.59 (10.74)	363		35.59 (7.34)	333		10.31 (7.21)	337	
Japan			<.001			<.001			<.001
Excellent/good	25.66 (11.15)	1,131		28.13 (8.14)	1,093		6.12 (4.87)	1,121	
Fair/poor	30.28 (11.57)	4,470		23.64 (8.19)	4,301		8.50 (5.86)	4,447	

Note. One-way analysis of variance (ANOVA) measure was used to compare mean scores of burnout dimensions between groups of nurses reporting excellent/good and fair/poor. All nurses reporting to the survey were included in this analysis.

Table 5
Unadjusted and Adjusted Odds Ratios (OR) With 95% Confidence Levels for Fair/Poor Quality of Care by Three Dimensions of Nurse Burnout Across Six Countries

	Burnout											
	Emotional Exhaustion				Depersonalization				Personal Accomplishment			
	Unadj. OR	Countries	95% CI for Adj. OR	Unadj. OR ^a	Adj. OR	95% CI for Adj. OR	Unadj. OR ^a	Adj. OR	95% CI for Adj. OR	Unadj. OR ^a	Adj. OR	95% CI for Adj. OR
U.S.	1.08 ^b	1.05 ^b	[1.04, 1.06]	1.11 ^b	1.07 ^b	[1.06, 1.08]	.96 ^b	.95 ^b	[.95, .97]			
Canada	1.08 ^b	1.06 ^b	[1.05, 1.06]	1.12 ^b	1.08 ^b	[1.07, 1.09]	.95 ^b	.95 ^b	[.95, .96]			
U.K.	1.07 ^b	1.04 ^b	[1.03, 1.05]	1.10 ^b	1.06 ^b	[1.04, 1.08]	.96 ^b	.97 ^b	[.96, .98]			
Germany	1.07 ^b	1.05 ^b	[1.03, 1.07]	1.09 ^b	1.08 ^b	[1.05, 1.10]	.96 ^b	.96 ^b	[.95, .98]			
New Zealand	1.08 ^b	1.06 ^b	[1.05, 1.08]	1.09 ^b	1.09 ^b	[1.07, 1.11]	.96 ^b	.96 ^b	[.96, .98]			
Japan	1.04 ^b	1.02 ^b	[1.01, 1.03]	1.07 ^b	1.07 ^b	[1.04, 1.09]	.94 ^b	.94 ^b	[.93, .96]			

OR, odds ratio.

^aUnadjusted odds ratios are from logistic regression models with only burnout variables as predictors. All adjusted estimates (OR) were derived from logistic regression models controlling for age, sex, years in the hospital, hours worked in week, number of patients assigned during the last shift, job dissatisfaction, and subscales of Practice Environment Scale of the Nursing Work Index.

^bOdds ratios that are significant at the .01 level.