

Nurse Staffing and Burnout: An Integrative Review

by

Elaine O'Neal

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Project Approved:

Supervising Professor: Linda Humphries, DNP, RN, ACNS-BC, CCRN

Department of Nursing

Ashley Franklin, PhD, RN, CCRN, CNE, CHSE

Department of Nursing

Karla O'Donald, M.A.

Department of Spanish and Hispanic Studies

ABSTRACT

Nurses are the primary providers of hospital based care and make up the largest portion of health care professionals in the United States. The phenomenon of nurse burnout affects nurses both domestically and internationally causing researchers to investigate factors potentially related to nurse burnout including nurse staffing. The purpose of this review is to synthesize evidence from sixteen surveys regarding the relationship between nurse staffing, nurse burnout, and factors that contribute to nurse burnout. The research does not indicate an optimal patient-nurse ratio appropriate for all nurses. However, the evidence does suggest that nurse perception of staffing may be a more accurate way to assess the effect the patient-nurse ratio has on nurses' experience of burnout. Future research should focus on nurses' perception of staffing assignments and should include a research design focused on in depth interview as the current data is saturated with surveys.

Burnout Related to Nurse-Patient Ratio

With over 2.7 million in the United States workforce as of 2012, nurses form the nation's largest health care profession (U.S. Department of Health and Human Services, 2010). They comprise the largest single component of hospital staff and are the primary providers of hospital-based patient care. Nurse staffing (otherwise referred to in this paper as the patient-nurse ratio) varies widely among hospitals and units but can significantly impact the experience of the working nurse. The purpose of this review is to synthesize the existing literature addressing the relationship between nurse staffing, nurse burnout, and nurse related outcomes that contribute to burnout.

Design

This is an integrative literature review to provide a current summation of the state of existing evidence regarding the relationship between the patient-nurse ratio and nurse burnout.

Methodology

Research articles were gathered through Medline, PubMed, CINAHL, PsychInfo and QVID databases using search terms "patient-nurse ratio", "nurse staffing" and "burnout", "job satisfaction", "quality of care", "stress level", or "emotional exhaustion". Research terms yielded a total of 57 articles. All methods of research conducted within the last 15 years presented in Spanish or English with the full text accessible via the TCU library were examined. In order to be selected, articles must have included the population of interest (hospital based working nurses of any specialization), examined nurse staffing as a variable, and measured burnout or factors contributing to burnout as an outcome. Articles that did not contribute to the research topic or that were not

available as full text were excluded. A total of sixteen studies met criteria and were included to provide a current integrative literature review of the existing research regarding the relationship between nurse staffing and burnout.

Results

All 16 sources included a survey design. Fourteen articles were cross sectional surveys and two articles reviewed longitudinal survey data from 1999 and 2006. One study conducted semi in depth interviews with participants in addition to survey question. Four studies were conducted in the United States with the remainder taking place in Ireland, Norway, Finland, Switzerland, Netherlands, Switzerland, Spain, Belgium, Sweden, Greece, Germany, England, South Africa, Thailand, South Korea, Lebanon, Japan, and China. Using the standardized John Hopkins research appraisal tool, all evidence rated as Level III in strength due to the non-experimental nature of an observational survey design. Quality of the evidence ranged from “Good” to “High” with large randomly selected samples, definitive conclusions, and usually high response rates.

Nurse Staffing and Burnout

The evidence generally suggests an increase in nurse burnout directly relates to an increased patient-nurse ratio. Among the four studies examining burnout conducted in the United States (table 1), findings were consistent among a variety of nursing units. In one study across 67 inpatient psychiatric hospitals, higher patient-nurse ratios were significantly associated with an increased risk of burnout amongst psychiatric nurses (Hanrahan et al. 2010). A longitudinal study involving general, orthopedic, and surgical nursing units by Aiken et al. (2002) across 168 hospitals found that each additional patient

per nurse was associated with a 23% increase in the probability of nurse reported burnout meaning working nurses in hospitals with a patient-nurse ratio of 8:1 would be 2.29 times as likely to experience burn out as those working in hospitals with a 4:1 patient-nurse ratio. In light of the implementation of California legislation mandating specific maximum patient-nurse ratios for various units in 2004, Aiken et al. (2010) conducted a comparison between California, New Jersey, and Pennsylvania on medical-surgical, pediatric, intensive care, telemetry, oncology, psychiatric, and labor/delivery units and found that the more patient-nurse assignments within a hospital that complied with the California legislation, the lower the overall rates of burnout.

Generally, the results of international studies mirrored those from the United States (table 2). In a cross sectional survey by Aiken et al. (2012) across 12 European countries and a cross sectional survey by Lu et al. (2015) conducted in Shang Hai, both burnout and job dissatisfaction were highly associated with an increased patient-nurse ratio. Interestingly, in the Aiken study, nurses in the United States had a substantially lower average patient-nurse ratio than most European counterparts. However, despite the more favorable staffing, the percentage of reportedly burnt out and dissatisfied nurses in the United States was strikingly close to the European mean. A similar study in South Africa by Coetzee et al. (2013) failed to find a statistically significant association between low nurse workload and low burnout, job satisfaction and intention to leave, however, in this situation, other environmental factors were attributed with stronger statistical significance for the nurse outcomes.

In a striking contrast, a high quality cross sectional survey by Kwak et al. (2010) conducted in South Korea discovered that while South Korean nurses experience higher

average patient-nurse ratios than western countries documented in the International Hospital Outcomes Survey, their rates of job satisfaction were higher and rates of burnout were comparatively lower. Researchers discuss possible reasons, including cultural, role and task assignment differences of the nurse working in Korea as compared to western nurses. However, a similarly designed study by Cho et al. (2010) also conducted in South Korea focused on nurses' perceived adequacy of staffing along with the numerical amount of patients per nurse. The study found that, while South Korean nurses working in the intensive care unit did care for more patients than those in the United States, the actual patient-nurse ratio had no significant relationship with nurse burnout nor job satisfaction. However, increased perception of staffing adequacy did significantly decrease nurse burnout and increase job satisfaction.

Though statistical significance was not unanimous, the trend of the evidence both domestic and abroad shows an association between high patient-nurse ratios and increased burnout. However, analysis of the results of the two studies based in South Korea suggests that nurses' *perception* of nurse staffing may influence burnout more significantly than the number of patients assigned to each nurse alone. This could also explain why European countries with higher patient-nurse ratios than those in the United States experience similar reported rates of burnout, yet still demonstrate a statistically significant relationship between nurse staffing and burnout. By measuring nurse perception of staff adequacy, results may actually reflect the way patient assignments affect nurses more accurately than the patient nurse ratio alone. By simply asking nurses to report the number of patients they cared for during their last shift and generating a unit average patient-nurse ratio, much of the research included in this review fails to take into

consideration the nurses' perception of staffing nurse and therefor misses the nurses' evaluation of staffing assignments based upon their experience as a nurse working in their unique environment. While the patient-nurse ratio alone can generate helpful data when comparing similarly operated hospitals within one cultural setting, this gap in the literature may prevent deeper understanding of the nurse experience caring for different patient assignments in diverse settings. Future research should focus on nurses' perception of staffing and inquire further as to what makes nurses' perceive staffing assignments differently across various units and international settings.

Nurse Staffing and Contributing Factors

Seven articles indirectly examine burnout as a culmination of contributing factors such as job dissatisfaction, stress, low perceived quality of care and emotional exhaustion (table 3). The literature indicates a general association between increased patient-nurse ratios and an increase in the previously mentioned negative nurse outcomes, however the specific patient assignment varies greatly between studies. A cross sectional survey paired with an in depth interview study conducted across 56 Belgian hospitals showed an increase from the average patient-nurse ratio of 10.4 correlated with increased nurse dissatisfaction (Heede et al. 2011). Two similarly designed studies conducted in Thailand by Nantsupawat et al. (2011, 2015) with average patient-nurse ratios of 10.1 and 11.1 respectively found significant increases in emotional exhaustion, job dissatisfaction, and low perceived quality of care with each additional patient assigned to the nurse workload.

Interestingly, the remaining four studies yielded similar results but had significantly lower average patient-nurse ratios. A cross sectional survey of nurses

working in 50 hospitals across England and Scotland with average patient-nurse ratios of 7.6:1 and 6.4:1 respectively found increased risk for emotional exhaustion and job dissatisfaction as the patient assignments increase (Sheward et al. 2005). Nurses surveyed in Shang Hai similarly reported decreased quality of care and increased job dissatisfaction at the patient nurse increased above the mean ratio of 5:1. However, in this instance a patient nurse ratio of 4 or less was associated with decreased chances of job dissatisfaction and increased perceived quality of care. In a cross sectional survey of nurses across 50 hospitals in South Korea, nurses caring for 3.0-3.4 patients on average experiences the highest level of job satisfaction (Lee et al. 2014). The variance amongst specific patient-nurse ratios coupled with a consistent association between staffing and burnout related nurse outcomes suggests that factors beyond the raw number of patients assigned to a specific nurse affect the nurse experienced burnout related to staffing. While Heede et al. (2011) conducted semi in depth interviews with the chief nursing officers of select hospitals included in the study to gain insight into the leadership and structure of each hospital, the research included in this review lacks data beyond cross sectional surveys. Future research should focus on in depth interviews with staff nurses to generate information on how they unique perceive staffing assignments and analyzed for possible reasons why certain groups of nurses are more comfortable with higher patient-nurse ratios than others.

Discussion

In this integrative review of sixteen studies, there is evidence of a general association between patient-nurse ratio and nurse burnout, however the research also alludes to the importance of nurse perception of staffing as a potentially more reliable

indicator of nurse burnout. Because the role of the working nurse varies across different departments as well as within the sociocultural context of different countries, nurses may perceive staffing adequacy uniquely depending upon their specific environment and culture. For instance, in California, legislation mandates that nurses on a medical-surgical unit may not be responsible for more than 5 patients at any given time and consequently these nurses report lower burnout when compared to nurses working on similar units in New Jersey and Pennsylvania (Aiken et al. 2010). However, in a similar European study by Heinen et al. (2013), countries with similar patient nurse ratios reported contrasting levels of burnout. In Ireland and the Netherlands, both with patient-nurse ratios of 6.8:1 and 6.9:1, 41% and 10% of nurses respectively reported high burnout scores. Belgium and Poland similarly share patient-nurse ratios of 10.4:1 and 10.5:1 but reported high burnout scores amongst 25% and 40% of nurses respectively. Additionally, in the 2010 study by Aiken et al. which indicated a statistically significant association between the patient-nurse ratio and burnout amongst 12 European countries, the lower average patient-nurse ratio in the United States as compared to most European countries did not change the fact that the level of nurse reported burnout in the United States closely mirrored that of Europe.

The data does not collectively indicate a specific patient nurse ratio that reduces nurse burnout across all settings, however units such as those studied in California, New Jersey, and Pennsylvania by Aiken et al. (2010) do seem to share enough structural and cultural commonality to indicate an optimal staffing range. While the research indicates a general association between increased patient-nurse ratios and increased levels of nurse burnout and contributing factors, the variation among patient-

nurse ratios internationally or in different specialty areas suggests variables beyond the patient-nurse ratio may uniquely affect nurses' perceptions of staffing.

Conclusion

The research included in this integrative shows a general increase in nurse burnout and associated factors as the patient-nurse ratio increases among nurses working in a variety of settings. The data does not indicate an optimal patient-nurse ratio appropriate for all nurses but rather points to the importance of measuring nurse perception of staffing as a potentially more accurate way to assess the effect the patient-nurse ratio has on nurses' experience of burnout. Other variables unique to specific groups of nurses or practice environments may also influence nurses' perception of staffing adequacy and should be examined in depth to better understand why certain groups of nurses experience burnout at varying patient-nurse ratios in comparison to other groups both internationally and on various nursing units. Future research should focus on nurses' perception of staffing assignments and should include a research design focused on in depth interview as the current data is saturated with cross sectional surveys. Continued research on this topic will help identify optimal staffing assignments appropriate to nurses working in a variety of settings as well as foster increased understanding of the experience of working nurses throughout the world.

Appendix

Table 1. Domestic Nurse Staffing and Burnout

| Citation | Method | Sample | Purpose | Results | Appraisal |
|------------------------|---|---|---|--|---|
| Aiken et al. (2010) | Cross sectional observational survey | 22,336 RNs 604 general hospitals Response rate: 90% | To determine whether the impact of the 2004 California minimum staffing laws | The higher the proportion of patient assignments in compliance with California legislation, the lower the nurse burnout and job satisfaction | High quality evidence Level III strength |
| Aiken et al. (2002) | Cross sectional longitudinal observational survey | 10,184 RNs 210 general hospitals Response rate: 52% | To determine the association between patient-nurse ratio and nurse retention. | 23% increase in probability of nurse reported burnout with each additional patient per nurse. 15% increase in probability of nurse reported job dissatisfaction with each additional patient per nurse. 8:1 patient-nurse ratio 2.29 more likely to report emotional exhaustion as 4:1 ratio. | Good quality evidence Level III strength |
| Hanrahan et al. (2010) | Cross sectional | 353 RNs providing | To examine association between | Lower staff levels and higher nurse | High quality evidence |

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|--------------------------|--|---|--|---|--|
| | observational survey | psychiatric patient care 67 hospitals with at least 3 psychiatric beds Response rate: 72% | organizational factors and nurse burnout on psychiatric inpatient units. | workloads were associated with higher risk of nurse burnout. | Level II strength |
| Kutney-Lee et al. (2013) | Retrospective two-stage cross sectional survey study | 42,000 RNs in 1999 25,000 RNs in 2006 137 hospitals that completed the Pennsylvania Registered Nurse Survey and Multi State Nursing Care and Patient Safety Survey 1999 and 2006 was used for this study. Response rate: 52% and 39% | To study how rates of burnout, intention to leave, and job satisfaction change in a panel of hospitals overtime. To examine relationships with work environment changes. | Percentage of nurses reported burned-out in hospitals that improved their staffing levels from 1999-2006 decreased by nearly 4% as compared to hospitals that did not change. No significant changes in percentage of nurses who intended to leave or were dissatisfied related to more favorable staffing levels. | High quality evidence Level III |

Table 2. International Nurse Staffing and Burnout

| Citation | Method | Sample | Purpose | Results | Appraisal |
|-----------------------|---------------------------------------|--|---|---|---|
| Aiken et al. (2012) | Cross sectional observational survey. | 61, 168 RNs 1,105 general acute care hospitals across 12 European Response rate: N/A | To examine whether reducing nurse staffing could negatively affect the quality of health care. | Lower nurse-patient ratio was associated with lower burnout and higher job satisfaction across Europe and the United States. | Good quality evidence Level III strength |
| Cho et al. (2009) | Cross sectional observational survey. | 1365 RNs 65 intensive care units in 22 hospitals in Korea. Response rate: 93%. | To examine the relationship between nurse staffing and nurse-reported burnout, quality of nursing care, job satisfaction, and intention to leave among ICU nurses in Korea. | Korean nurses cared for an average of 2-8 patients (US average 1-2 patients per nurse in the ICU setting). Perceived staffing adequacy increased job satisfaction and decreased burn out. The actual number of patients per nurse had no significant relationship with them. | High quality evidence Level III |
| Coetzee et al. (2013) | Cross sectional observational survey | 1187 RNs 55 private hospitals and 7 public referral hospitals | To study the association of modifiable features such as nurse patient ratio with nurse outcomes | Low nurse workload generally associated with low burnout, low job dissatisfaction, low intent to | Good quality evidence Level III |

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|--------------------|--------------------------------------|--|---|---|---|
| | | <p>each with at least 100 beds in South Africa</p> <p>Response rate: 42.4%</p> | such as burnout. | <p>leave. Results not statistically significant.</p> <p>Other components of the practice environment were attributed statistically significant with nurse outcomes</p> | |
| Kwak et al. (2010) | Cross sectional observational survey | <p>496 RNs</p> <p>23 general hospitals with over 200 beds in South Korea.</p> <p>Nurses working in intensive care settings were excluded.</p> <p>Response rate: 89%.</p> | To examine associations and identify predictors between burnout, job satisfaction, organizational support, and reported quality of care and to compare results with International Hospital Outcomes Survey. | <p>In comparison to western counterparts, South Korean nurses had higher patient-to-nurse ratio, higher rates of job satisfaction, and lower burnout.</p> <p>Researchers speculate findings may have to do with differing responsibilities.</p> | <p>High quality evidence</p> <p>Level III</p> |
| Lu et al. (2015) | Cross sectional observational survey | <p>Systemic cluster sample</p> <p>856 RNs</p> <p>Medical surgical wards in 10 secondary and 10 tertiary</p> | To examine how nurse staffing in Shang Hai influences nurse job satisfaction and quality of care. | Nearly half of the nurses in this sample reported burnout and job dissatisfaction, highly associated with nurse staffing. Nurses caring for 8 or more patients reported | <p>High quality evidence</p> <p>Level III</p> |

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| | | hospitals in Shanghai Response rate: 99.19% | | significantly more dissatisfaction than those caring for 4 or less. | |
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Table 3. Factors Contributing to Burnout

| Citation | Method | Sample | Purpose | Results | Appraisal |
|-------------------------|---|---|--|--|--|
| Heede et al. (2013) | Cross sectional observational survey, semi structured in-depth interviews | 3,186 RNs 272 adult general surgical, internal medicine, and mixed surgical-medical from 57 hospitals in Belgium Response rate: 72% | To study the impact of the nurse practice environment, staffing, and education on nurse reported intention to leave, to better understand nurse retention strategies | Greater than average (10) patient-nurse ratio was associated with higher rates of job dissatisfaction . Staff adequacy consistently rated higher than the reference population in the three highest performing hospitals, and consistently rated lower in the three lowest performing hospitals. | High quality evidence Level III |
| Heikkinen et al. (2009) | Cross sectional observational survey | 541 RNs with at least one month of experience Medical, surgical, and | To investigate the relationship between patient nurse ratio and the nurses' job satisfaction, stress level, | No direct relationship between the patient nurse ratio and nurse outcome variables was identified. | Good quality evidence Level III |

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|-------------------|---|--|---|---|--|
| | | neurological inpatient units in 5 university hospitals in Finland Response rate: 63% | perceived quality of care and intention to leave. | Average patient-nurse ratio 9.17. Researchers believe it logical to assume that adequate staffing increases nurse possibilities for job satisfaction, low stress, and high quality of care. | |
| Lee et al. (2014) | Multilevel logistic regression modeling, cross sectional observational survey | 5654 RNs in Korean Health and Medical Worker's Union 50 hospitals in South Korea Response rate: 48.2%. | To examine whether nurse staffing at the hospital effects job satisfaction and turn-over | Hospitals with a bed-to-nurse ratio of 3.0 and 3.4 had the highest level of job satisfaction. No hospital level variable was significantly related to nurse's intention to leave. | Fair quality evidence Level III |
| Lu et al. (2015) | Cross sectional observational survey | Systemic cluster sample 856 RNs Medical surgical wards in 10 secondary and 10 tertiary | To examine how nurse staffing in Shang Hai influences nurse job satisfaction and quality of care. | Perceived quality of care and job dissatisfaction were highly associated with nurse staffing. Patient nurse ratio of 4 or less was associated | High quality evidence Level III |

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|---------------------------|---|--|--|---|--|
| | | hospitals in Shanghai Response rate: 99.19% | | with decreased odds of job dissatisfaction and increased odds of perceived quality care. Average patient-nurse ratio 5:1. | |
| Nantsupawat et al. (2011) | Predictive correlational design using secondary data analysis of 2007 survey. | 5,247 RNs 13 general and 26 regional hospitals in Thailand Response rate 92%. | To determine the impact of staffing and the work environment on job satisfaction, burnout and quality of care. | Average patient nurse ratio 10:1. Each additional patient added to nurse's workload was associated with a 2% increase in the odds of high emotional exhaustion and a 4% increase in the odds of the nurse reporting patient care as fair or poor. | High quality evidence Level III |
| Nantsupawat et al. (2015) | Cross sectional observational survey | Stratified random sampling 25-30 nurses from each hospital working on inpatient units caring for less | The aim of this study was to examine how nurse staffing levels influence nurse outcomes. | Average patient nurse ratio was 11:1. Each additional patient assigned per nurse was associated with a 5% increase in the odds of | High quality evidence Level III |

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|-----------------------|---------------------------------------|---|---|---|---|
| | | <p>than 21 patients</p> <p>92 community hospitals with greater than 90 beds in Thailand</p> <p>Response rate: 98.6%.</p> | | <p>job dissatisfaction, and an 8% increase in the odds of emotional exhaustion.</p> | |
| Sheward et al. (2005) | Cross sectional observational survey. | <p>5006 RNs in England</p> <p>3773 RNs in Scotland</p> <p>51 hospitals with at least 100 employed RNs</p> <p>Response rate: 50%</p> | To examine relationship between emotional exhaustion, job satisfaction, nurse workload, nurse characteristics and hospital variables. | <p>Average nurse patient ratios for Scotland and England were 1:6.4 and 1:7.6 respectively.</p> <p>Increasing numbers of patients to nurses was associated with increasing risk of emotional exhaustion and dissatisfaction with current job.</p> | <p>Good quality</p> <p>Level III strength</p> |

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