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How does the patient to nurse ratio relate to the quality of patient care and nurse burnout in the hospital?

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**How does the patient to nurse ratio relate to the quality of patient care and nurse burnout
in the hospital?**

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NURS 4500: Nursing Research and Senior Thesis

Dr. Patricia Harris

December 2020

Abstract

The patient-to-nurse ratio is a topic that affects all nurses. A review of the research literature was performed to study this vital issue. Data was obtained from surveys conducted in numerous countries, including the United States, Canada, the United Kingdom, Taiwan, and Chile. The evidence showed that an increased patient-to-nurse ratio motivated nurses' intention to leave their job. A higher patient-to-nurse ratio was found to have been associated with higher levels of personal burnout, client-related burnout, and job dissatisfaction in nurses. Currently in California, in medical-surgical units, the registered nurse staffing mandate is at one nurse to five patients. When nurses' workloads were in line with California's mandated ratios, nurses' burnout and job dissatisfaction were lower, and nurses reported consistently better quality of care. Furthermore, there was a decrease in nurses receiving verbal abuse from patients or other staff and complaints from patients and their family.

In addition, a theoretical model is presented, which offers a hypothesis that nurses' level of education may be a factor in affecting patient outcomes. In this paper, I propose a study to examine how a baccalaureate degree in nursing may affect patient mortality and failure to rescue.

Table of Contents

Abstract.....	2
Introduction.....	4
Research Questions.....	4
Literature Review.....	4
Patient to Nurse Ratio and the Quality of Patient Care.....	5
Patient to Nurse Ratio and Nurse Burnout.....	9
Conclusion.....	12
Theoretical Framework.....	12
Research Proposal.....	13
Study Design.....	14
Description of Sample.....	14
Ethical Considerations.....	15
Data Analysis.....	15
Conclusion.....	16
References.....	17
Appendix.....	19

Introduction

In California in the medical-surgical unit, the registered nurse staffing mandate is currently at one nurse to five patients. The patient to nurse ratio in hospitals is important to keep well balanced since without it it can lead to lower quality of patient care, higher patient mortality, burnout in nurses, workplace injuries, and an increase in failure to rescue. Lower quality of patient care can be defined as alarm fatigue, medication errors, increased length of stay, higher risk of patient mortality, and more patient dissatisfaction. Failure to rescue is defined as death following the development of a complication. An unbalanced patient to nurse ratio does not only negatively affect patients. It can also lead to burnout in nurses and job dissatisfaction. However, in this thesis we will be focused on the patient-to-nurse ratio and burnout in nurses and how they can affect patient care.

Research Questions

How does the patient to nurse ratio affect the quality of patient care in the hospital?

Does the patient to nurse ratio relate to burnout in nurses?

Literature Review

The research articles were found using different databases through the Dominican University of California library such as Cochran, CINAHL, PubMed, and Google Scholar. The search terms used were nurse-patient ratio, nurse-patient ratio med surg, nurse-patient ratio California, nurse-patient ratio and quality of patient care, and nurse burnout. A total of six articles were found that specifically related to the topic and included in this literature review.

This literature review will be split into two categories, articles demonstrating how the patient to nurse ratio relates to the quality of patient care and articles showing how the patient to

nurse ratio relates to nurse burnout. A summary of each article, including the strengths and limitations, can be found listed in the literature review table in the Appendix.

Patient to Nurse Ratio and the Quality of Patient Care

Aiken, et al (2011) sought “to determine the conditions under which the impact of hospital nurse staffing, nurse education, and work environment are associated with patient outcomes” (p.1). Another article from Aiken, et al (2010) aimed “to determine whether nurse staffing in California hospitals, where state mandated minimum nurse-to-patient ratios are in effect, differs from two states without legislation and whether those differences are associated with nurse and patient outcomes” (p.904). “Identifying the relationship between the workload of the nursing team and the occurrence of patient safety incidents linked to nursing care in a public hospital in Chile” was the goal of the article by Carlesi, et al (2017, p.1). Lastly, McHugh, et al (2012) wanted “to examine the differential effect of California’s staffing mandate on safety-net and non-safety-net hospitals” (p.160).

Aiken, et al (2011) studied data from hospital discharge abstracts for 1,262,120 general, orthopedic, and vascular surgery patients, had mail surveys from a random sample of 39,038 hospital staff nurses, and American Hospital Association data from California, Pennsylvania, Florida, and New Jersey. The survey assessed topics such as nurse workloads, nurse education, nurse work environment, nurse demographics, burnout, job dissatisfaction, intent to leave, the quality of care, patient safety indicators, and frequency of adverse events on their unit. They “estimate the relationship between measures of levels of nurse-to-patient staffing, organizational aspects of the nurse work environment, and nurse education—three hospital-level measures derived from the nurse surveys—and risk-adjusted 30-day inpatient mortality and failure to rescue across 665 adult acute care general hospitals in California, Pennsylvania, Florida, and

New Jersey” (Aiken, et al, 2011, p.2). The researchers found that decreasing workloads by only one patient per nurse (for example, decreasing the work load from one nurse who cares for six patients to one nurse per five patients) did not demonstrate a significant change in in-hospital patient deaths or failure-to-rescue scenarios in hospitals with poor work environments. However, there was a small effect on the odds for decreasing patient deaths by 4% and rescue failures in hospitals with average work environments. In hospitals that reportedly had the best environments the effect on decreasing patients’ deaths and rescue failures by 9% and 10% respectively (Aiken, et al, 2011).

Interestingly, the effect of an increased percentage of Baccalaureate of Science Nursing (BSN) nurses at the bedside decreased the odds of a patient dying in the hospital or of the healthcare team failing to rescue the patient across all three categories of hospitals, by roughly 4%. “While the positive effects on increasing percentages of BSN nurses is consistent across all hospitals, lowering the patient-to-nurse ratios markedly improves patient outcomes in hospitals with good work environments, slightly improves them in hospitals with average environments, and has no effect in hospitals with poor environments” (Aiken, et al, 2011, p.2). Notably, the researchers did not clearly define the differences between poor, average, and best hospitals, which is a limitation for the study (see the Literature Review Table at the Appendix for a synopsis of limitations and strengths).

Aiken, et al (2010) compared “primary data from surveys completed in 2006, two years after the start of the mandatory ratios, by nearly 80,000 RNs in California, New Jersey, and Pennsylvania. New Jersey and Pennsylvania were chosen to compare with California not only because of survey funding availability but also because neither state has enacted nurse staffing legislation at the time; they are admittedly a convenience sample of states” (p.904). The survey

included topics about the name of their employing hospital, information on their work environments including their patient workloads, and the numbers of nurses and patients on their unit on their last shift. The researchers found that hospitals that met a criterion based on California nurse staffing mandates whether they were out of California or not had better outcomes for nurses and patients. The higher the amount of nurses with a patient assignment in accordance with the criterion based on California mandated ratios, the lower the nurse burnout and job dissatisfaction, the lower chance of a nurse reporting that their workload caused them to miss alterations in their patients' conditions, and the less likely that the nurses are intent to leave their job (Aiken et al, 2010). In addition, the more that hospitals conform to the standard of California's staffing mandates, no matter the hospital's location, the lower the chance of nurses receiving verbal abuse from patients or staff, reporting complaints from the patient or their families, complaints of low or only fair quality of care, and uncertainty that patients are able to manage after their discharge (Aiken et al, 2010).

In Latin America, incidents of patient safety is defined as “an event or circumstance that may have or effectively have caused unnecessary harm to patients, including incidents related to medication dispensing, falls, accidents with patients, medical equipment and infections associated with health care” (Carlesi, et al, 2017, p.2). The researchers did a cross sectional analytical study that was done in a public hospital in the city of Viña del Mar, Chile, in December 2011 and January and February 2012. The population consisted of 3430 patients hospitalized in the 11 services. The nursing team was comprised of 85 nurses and 157 nursing assistants that worked in the 11 services during the study period. “The response variable selected was the incident of patient safety, which was classified into: errors in dispensing medication, patient falls, self-removal of invasive devices and incidents associated with mechanical

containment; and as an explanatory variable: the workload nurses and nursing assistants” (Carlesi, et al, 2017, p.2). They found that the highest workloads were observed in the medical-surgical and surgical specialty services, it varied from 1:20.5 to 1:24.5 for the day shift and 1:48 to 1:57 for the night shift. There was also found to be a positive correlation between higher workloads and higher fall rates of patients. However, they did not find a correlation between higher workloads and more medication errors, greater chance of self-removal of invasive devices, and more incidents associated with mechanical containment (Carlesi, et al, 2017). A limitation of the study is that it was conducted in only one hospital, so the results are valid only for that hospital.

McHugh, et al (2012) “used a time series design to compare the effects of Assembly Bill 394 (AB 394) on nurse staffing and skill mix in safety-net hospitals and non-safety-net hospitals in California from 1998 to 2007” (p.160). AB 394 is California’s minimum hospital nurse staffing mandate that was signed into law in 1999 and took effect in 2004. Skills mix is defined as the number of registered nurses out of all nursing staff. “The Institute of Medicine defines safety-net hospitals as having two distinguishing characteristics: “(1) by legal mandate or explicitly adopted mission they maintain an ‘open door’, offering access to services for patients regardless of their ability to pay; and (2) a substantial share of their patient mix is uninsured, Medicaid, and other vulnerable patients” (Lewin and Altman, 2000, p.21 as cited in McHugh, et al, 2012). The primary data for this research came from the Annual Hospital Disclosure data files from the California Office of Statewide Health Planning and Development (OSHPD) for the years 1998 to 2007. Information on all California hospitals including staffing and hospital characteristics and data from the U.S Bureau of Labor Statistics and the Centers for Medicare and Medicaid Services (CMS) were gathered. The researchers found that California’s staffing

mandate increased staffing for both safety-net and non-safety-net hospitals in California. It was improved by decreasing one patient less per nurse on average with no reduction in skills mix. The increased nurse staffing levels resulting from AB 394 has an overall positive effect on patient outcomes because it allows nurses to stay within a certain patient-to-nurse ratio, which in California is one nurse to five patients. Because researchers use different definitions, the definition chosen could influence the results” (McHugh, et al, 2012), which is a limitation of the study.

Patient to Nurse Ratio and Nurse Burnout

Aiken, et al (2002) aimed “to examine the effects of nurse staffing and organizational support for nursing care on nurses’ dissatisfaction with their jobs, nurse burnout, and nurse reports of quality of patient care in an international sample of hospitals” (p.5). Chen, Yi-Chuan, et al (2019) examined “the effects of the patient-nurse ratio (PNR) on nurses’ intention to leave and considering the mediating roles of burnout and job dissatisfaction” (p.1). They defined burnout as “a state of physical, emotional, and mental exhaustion and fatigue, which usually derives from work-related demands in a person’s life. Recognized as a result of chronic workplace stress without successful management, burnout will be a medical diagnosis in the International Classification of Diseases 11th Revision (ICD-11) from 1 January 2022” (Chen, Yi-Chuan, et al, 2019, p.5).

Aiken, et al (2002) study included the International Hospital Outcomes Study Consortium which “consists of seven interdisciplinary research teams headed by the University of Pennsylvania’s Center of Health Outcomes and Policy Research. The study includes over 700 hospitals located in the United States (Pennsylvania), three provinces in Canada (Ontario, Alberta, British Columbia), England, Scotland, and Germany” (p.6). They gathered information

from surveys of nurses, patient discharge data, and secondary data on hospital characteristics. Nurses in study hospitals were given the surveys to acquire more information on the hospital organizational attributes, managerial policies, staffing, and resource availability, job satisfaction and burnout, and nurse-assess patient outcomes. They discovered from the surveys across all five jurisdictions that there were considerable levels of job dissatisfaction and burnout. Burnout scores above average for medical staff varied from 54% in Pennsylvania to 34% in Scotland (Aiken, et al, 2002).

The two independent variables were nurse staffing and organizational support. When nurse staffing was improved, better nurse-assessed quality of care was positively associated. However, it is not as beneficial as the effect of organizational support altogether. They determine that once the entire organization is managed, nurses in both the worst staffed and best staffed hospitals were equally to rate the quality of care on their units as fair or poor. Nurses in hospitals with the lowest levels of organizational support for nursing care were more than twice as likely to state dissatisfaction with their jobs and have burnout scores above average for medical staff (Aiken, et al, 2002). Overall, “deficiencies in hospital care were found in the five jurisdictions included in the present analysis representing the United States, Canada, and the UK. In addition to uneven quality of care, high levels of nurse job dissatisfaction and burnout signal the potential for a worsening international nursing shortage” (Aiken, et al, 2002, p.9).

In Taiwan, the average daily patient-nurse ratios (ADPNRs) are set according to hospital levels (primary, secondary, or tertiary). They have been in effect since May 1, 2019 for medical and surgical units. “The ADPNR is calculated by the total number of beds*bed occupancy rate per month*3 (shifts)/average total number of daily nurses per month; head nurses, nurse practitioners, and student nurse are excluded. The ADPNRs of tertiary hospitals, secondary

hospitals, and primary hospitals should be less than or equal to 9, 12, and 15, respectively” (Chen, Yi-Chuan, et al, 2019, p.2). The researchers conducted two cross-sectional studies in 2013 and 2014 using a questionnaire, 680 questionnaires were given to 54 primary hospitals and 399 were completed. In primary hospitals, the ADPNRs ranged from 4.6 to 25.7 so data from primary hospitals were ruled out in the final analysis. In both secondary and tertiary hospitals, 1004 questionnaires were given out and 844 were completed in 2013. In 2014, 1378 of the same nurses were recruited and 1190 once again completed the questionnaire. In the secondary and tertiary hospitals, the ADPNRs were 13.1 and 10.7 respectively (Chen, Yi-Chuan, et al, 2019).

The nurses’ intention to leave their job may be sorted into two categories, demographics and hospital context. Demographics include things such as age, gender, marital status, educational level, and work tenure. Hospital context includes inadequate nurse staffing, workload, workplace injustice, workplace violence, interpersonal relationship, burnout, and job dissatisfaction (Chen, Yi-Chuan, et al, 2019). Single marital status, unsatisfactory workplace justice, ill nurse-physician relationships, no nurse staff leadership, and no participation in hospital affairs were found to correlate positively with intention to leave (Chen, Yi-Chuan, et al, 2019). The researchers determined that an increased patient-to-nurse ratio would influence the nurses’ intention to leave their job. This was mainly mediated by personal burnout, client-related burnout, and job dissatisfaction. No clear definition of “primary”, “secondary”, and “tertiary” hospitals was given which is a limitation of this study.

Literature Review Conclusion

The findings from the research articles in this literature review demonstrate that the patient to nurse ratio affects the quality of patient care and relates to nurse burnout. The outcomes answer the research questions proposed by this literature review. All articles show an association between a decreased patient-nurse ratio and improved patient outcomes, lower mortality rates, and a decrease in burnout in nurses. One strength of all articles is that each used a large sample to represent the population, thus increasing the opportunity for generalizability. A limitation would be that some of the articles do not state definitions clearly or have a cross-sectional study which cannot establish causality. The findings are practical and demonstrate that lower patient-to-nurse ratios have the potential to change outcomes for both patients and nurses in the long run.

Theoretical Framework

Linda H. Aiken, Ann Kutney-Lee, and Douglas M. Sloane are all professors of Nursing at the University of Pennsylvania. In their study, the researchers examined whether “changes in nurse-reported staffing levels, skill mix, years of experience as a registered nurse,” and type of nursing degree correlated with “changes in rates of surgical patient mortality and failure to rescue” (Kutney-Lee, Sloane, & Aiken, 2013, p.1-2). According to the 2008 National Sample Survey of Registered Nurses, only 45% of nurses in the United States had a baccalaureate degree. However, the authors mention that an Institute of Medicine report strongly recommended that by 2020, 80% of the nursing workforce should at least have a baccalaureate degree (Kutney-Lee, et al, 2013).

A theoretical framework showing how having a baccalaureate degree can decrease patient mortality and affect outcomes over time is presented in this research article. Mitchell,

Ferketich, and Jennings created The Quality Health Outcomes Model (QHOM). It is a risk reduction model that demonstrates how nurse surveillance capacity has a direct effect on patient outcome. Nurse surveillance capacity can be defined as characteristics that strengthen or weaken nurse surveillance. They include staffing, education level, clinical expertise, years of experience, and the practice environment. The key factor of why nurses with baccalaureates have higher patient outcomes is unclear. The researchers hypothesize that baccalaureate education has a positive association with nurses' critical thinking and judgement skills which are vital to the surveillance for risks of adverse events (Kutney-Lee, et al, 2009). Nurse experience, defined by the number of years worked as a registered nurse, skills mix, and staffing levels were not a substitution for higher education in terms of improving patient outcomes. Increasing the percentage of nurses with a baccalaureate degree was significantly associated with improvements over time in rates of surgical patient mortality and failure to rescue (Kutney-Lee, et al, 2013). The model showed that obtaining a baccalaureate degree can lead to higher quality of patient care by decreasing patient mortality overtime.

Research Proposal

The literature review indicated that a lower patient-to-nurse ratio was associated with better patient outcomes. However, there are many other factors that can influence patient outcomes. Therefore, I propose a study examining the additional factor of nursing education level, specifically a baccalaureate degree, in relation to patient mortality and failure to rescue. The study will also further examine patient-to-nurse ratio in relation to quality of care and nurse burnout. A perceivable gap is that there are no articles about baccalaureate degrees and nursing included in the literature review.

Research Study Design

Decreased patient to nurse ratios has led to improved patient and nurse outcomes which this paper demonstrates. The three main research questions being studied are:

- Does a baccalaureate degree in nursing affect patient mortality and rate of failure to rescue?
- How does the patient-to-nurse ratio affect the quality of patient care in the hospital?
- Does the patient-to-nurse ratio relate to burnout in nurses?

This author hypothesizes that a lowered patient to nurse ratio will cause an increase in improved patient outcomes, lower mortality rates, and a reduction of nurse burnout. The primary aim of this study is to show the relationship between a lowered patient to nurse ratio along with the positive effects it can have for both the patient and the nurse.

Description of the Sample

This study will be a prospective cross-sectional qualitative and quantitative mixed method online study. The aim will be to recruit 300 nurses working on a Medical-Surgical unit in three hospitals in the San Francisco Bay Area. A survey will be sent out to the message boards at the hospitals and through Sigma Theta Tau databases. Snowball sampling, recruitment via word-of-mouth, will be encouraged. The survey will be open and accessible for three months with an aim of obtaining at least 100 participants. The eight questions will use a numeric scale from 1-10, including one free response section at the end. Those questions will assess their demographics (age, gender, years of experience, education level), average daily patient to nurse ratios, failure to rescue, and their extent of feeling burnout.

Ethical Considerations

Ethical considerations would include keeping the survey confidential and anonymous by having the data on a laptop which only the researcher will have the password to, leaving information for a local health official in case the questions will trigger a nurse or cause them to be in distress from a memory of a previous patient, and making sure no data collection will begin until approved by the Dominican Internal Review Board. Participants will be informed that they may stop the survey at any time. Potential participants will be informed that if they choose to submit the survey, the submission will constitute informed consent.

Data Analysis

The total sample will include 300 nurses working on a Medical-Surgical unit in hospitals the San Francisco Bay Area. I will be using descriptive statistics, specifically hypothesis testing, to analyze the data from the surveys. I will use the independent sample chi-square test to assess if there is a correlation between an average patient to nurse ratio and quality of patient care and nurse burnout and nurse education level and failure to rescue. Content analysis will be performed to identify common words or phrases and organize those into different categories to determine themes.

Based on my anecdotal observation of nursing employment in the San Francisco Bay Area, I predict that the sample will be at least 60% female with a mean age of 35, a range of experience as a registered nurse from two to forty years, and that 70% of survey participants will have a baccalaureate degree. I hypothesize the data will show an average patient to nurse ratio of four or five patients to one nurse and a mode of seven on a scale of 1-10, in regard to feeling burnout. I anticipate common themes in the free response section will be about the leadership at the hospital, trauma from a past patient, or recommendations for average patient to nurse ratios.

Conclusion

The findings of this research article have demonstrated that a decreased patient-to-nurse ratio can lead to improved patient outcomes, lower patient mortality, and a decrease in nurse burnout. The research questions were answered, the Kutney-Lee et al study showed that having a baccalaureate degree was associated with improved surgical patient mortality and failure to rescue over time. As more hospitals adapt to California's nurse staffing mandates, which gives nurses a patient assignment based on California mandated ratios, the lower the nurse burnout and job dissatisfaction. Furthermore, adjusting to California's mandated ratios has shown fewer complaints from patients or their families of poor quality of care as well as lower chances of nurses receiving verbal abuse from patients or other staff. A proposed study examining nursing education as a factor of patient mortality and failure to rescue will show how crucial it is for registered nurses to have a BSN and how it can affect their patient's fate.

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Appendix

Author/Citation	Purpose	Sample	Type of Study/Methods	Strengths/Limitations	Results/Key Findings
<p>Aiken, Linda H, et al. "Effects of Nurse Staffing and Nurse Education on Patient Deaths in Hospitals with Different Nurse Work Environments." <i>Medical Care</i>, U.S. National Library of Medicine, Dec. 2011, www.ncbi.nlm.nih.gov/pmc/articles/PMC3217062/.</p>	<p>To determine the conditions under which the impact of hospital nurse staffing, nurse education, and work environment are associated with patient outcomes.</p>	<p>665 hospitals in four large states were studied through linked data from hospital discharge abstracts for 1,262,120 general, orthopedic, and vascular surgery patients, a random sample of 39,038 hospital staff nurses, and American Hospital Association data.</p>	<p>Quantitative Retrospective Cross-sectional. Multi-site Descriptive Comparative</p> <p>Mail survey, response rate of 39%</p>	<p>Large sample size of hospitals in several states improve ability to generalize results across the U.S</p> <p>Lack of clear definitions for "good, "average", and "poor" work environments; Cross-sectional design limits ability to establish causality; there may have been extraneous variables that were not taken into account.</p>	<p>The effect of decreasing workloads by one patient/nurse on deaths and failure-to-rescue is virtually nil in hospitals with poor work environments, but decreases the odds on both deaths and failures in hospitals with average environments by 4% and in hospitals with the best environments by 9 and 10% respectively.</p> <p>Lowering the patient-to-nurse ratios markedly improves patient outcomes in hospitals with good work environments, slightly improves them in hospitals with average environments, and has no effect in hospitals with poor environments.</p>
<p>Aiken, Linda H., et al. "Hospital Staffing, Organization, and Quality of Care: Cross-National Findings." <i>OUP Academic</i>, Oxford University Press, 1 Feb. 2002, academic.oup.com/intqhc/artic</p>	<p>To examine the effects of nurse staffing and organizational support for nursing care on nurses' dissatisfaction with their jobs, nurse burnout, and nurse reports of quality care in an international sample of hospitals.</p>	<p>10,319 nurses working on medical and surgical units in 303 hospitals across the five jurisdictions. Adult acute-care hospitals in the United States (Pennsylvania), Canada (Ontario and British Columbia), England, and Scotland</p>	<p>Quantitative Multi-site Cross-sectional Descriptive Comparative</p> <p>Survey of nurses in three countries to examine nurses' perceptions of Dependent variables: nurse staffing, organizational support for nursing care; and Independent variables:</p>	<p>Little research has been performed on the topic, so researchers are among the first to report on: "modifiable attributes of hospital organization and staffing affect patient outcomes and nurse retention in order to improve decision making on how best to meet the challenges faced by hospitals without adversely affecting patient outcomes, "potentially improving understanding link between organization and outcomes.</p>	<p>Dissatisfaction, burnout, and concerns about quality of care were common among hospital nurses in all five sites, response rate of 42-53% across geographic jurisdictions.</p> <p>Organizational/managerial support for nursing had a pronounced effect on nurse dissatisfaction and burnout, and both organizational support for nursing and nurse staffing were directly, and independently, related to nurse-assessed quality of care. Multivariate results imply that nurse reports of low-quality care were three times as likely in hospitals with low staffing and support for nurses as in hospitals with high staffing and support.</p>

Author/Citation	Purpose	Sample	Type of Study/Methods	Strengths/Limitations	Results/Key Findings
le/14/1/5/2739511.			nurses' dissatisfaction with their jobs, nurse burnout; nurse reports of quality care	Cross-sectional design limits the ability to establish causality; self-report of nurses limits reliability of the data	Adequate nurse staffing and organizational/managerial support for nursing are key to improving the quality of patient care, to diminish nurse job dissatisfaction and burnout and, ultimately, to improving the nurse retention problem in hospital settings.
Aiken, Linda H, et al. "Implications of the California Nurse Staffing Mandate for Other States." <i>Health Services Research</i> , Blackwell Science Inc, Aug. 2010, www.ncbi.nlm.nih.gov/pmc/articles/PMC2908200/.	To determine whether nurse staffing in California hospitals, where state-mandated minimum nurse-to-patient ratios are in effect, differs from two states without legislation and whether those differences are associated with nurse and patient outcomes.	Primary survey data from 22,336 hospital staff nurses in California, Pennsylvania, and New Jersey in 2006 and state hospital discharge databases.	Quantitative, Descriptive Modified Dillman approach (method of providing a two prong-approach to improving survey data quality and quantity) using two survey mailings, first response rate was 35.4%, second response rate 91% (monetary incentive)	Large sample size across 3 states provides diverse and representative samples across the United States Cross-sectional design does not allow causality to be established; self-report of nurses limits reliability of the data	California hospital nurses cared for one less patient on average than nurses in the other states and two fewer patients on medical and surgical units. Lower ratios are associated with significantly lower mortality. When nurses' workloads were in line with California-mandated ratios in all three states, nurses' burnout and job dissatisfaction were lower, and nurses reported consistently better quality of care. Hospital nurse staffing ratios mandated in California are associated with lower mortality and nurse outcomes predictive of better nurse retention in California and in other states where they occur
Carlesi, Katya Cuadros, et al. "Patient Safety Incidents and Nursing Workload." <i>Revista Latino-Americana De Enfermagem</i> , Escola De Enfermagem De Ribeirão Preto /	To identify the relationship between the workload of the nursing team and the occurrence of patient safety incidents linked to nursing care in a public hospital in Chile.	85 nurses and 157 nursing assistants in Vina del Mar, Chile.	Quantitative, analytical, cross-sectional study Descriptive univariate and multivariate analysis were performed	This study was conducted in only one hospital which cause the results to be valid only for that hospital	879 post-discharge clinical records and the workload of 85 nurses and 157 nursing assistants were analyzed. The overall incident rate was 71.1%. It was found a high positive correlation between variables workload (r=0.911 to r=0.9919) and rate of falls (r=0.8770). The medication error rates, mechanical containment incidents and self-removal of invasive devices were not correlated with the workload. The workload was high in all units except the intermediate care unit. Only the rate of falls was associated with the workload.

Author/Citation	Purpose	Sample	Type of Study/Methods	Strengths/Limitations	Results/Key Findings
Universidade de São Paulo, 6 Apr. 2017, www.ncbi.nlm.nih.gov/pmc/articles/PMC5396482/.					
Chen, Yi-Chuan, et al. "Patient-Nurse Ratio Is Related to Nurses' Intention to Leave Their Job through Mediating Factors of Burnout and Job Dissatisfaction." <i>International Journal of Environmental Research and Public Health</i> , MDPI, 29 Nov. 2019, www.ncbi.nlm.nih.gov/pmc/articles/PMC6926757/.	Whether the nurse-patient ratio affects their intention to leave the nursing profession, along with underlying stress pathway. Investigates the effects of the patient-nurse ratio on nurses' intention to leave and considering the mediating roles of burnout and job dissatisfaction.	A total of 1409 full-time registered nurses in medical and surgical wards of 24 secondary or tertiary hospitals in Taiwan.	Quantitative Two cross-sectional descriptive studies Self-administered questionnaires, response rate of 59.2% sent one year apart (2013 and 2014).	Researchers included modifiers and covariates in their analysis Does not define primary, secondary, and tertiary hospitals	The association between the standardized average daily patient-nurse ratio and intention to leave their job was significantly mediated by personal burnout, client-related burnout, and job dissatisfaction. Higher standardized average daily patient-nurse ratios predicted higher levels of personal burnout, client-related burnout, and job dissatisfaction, each of which resulted in higher levels of intention to leave the current job. We found that an increased patient-nurse ratio would induce nurses' intention to leave their job. This effect was mainly mediated by personal burnout, client-related burnout, and job dissatisfaction.
McHugh, Matthew D, et al. "Impact of Nurse Staffing Mandates on Safety-Net Hospitals: Lessons from California." <i>The Milbank Quarterly</i> , Blackwell Publishing	To examine the differential effect of California's staffing mandate on safety-net and non-safety-net hospitals.	Annual Hospital Disclosure data files from the California Office of Statewide Health Planning and Development (OSHPD) for the years 1998 to 2007	Quantitative, Longitudinal, Time-series design	Previous data only extended through 2004, the year of staffing mandate implementation. These researchers filled the gap in by using data before and after implementation to assess how safety-net and other hospitals responded to the mandate in later years. Analyzed data over a long period of time No set definition of a safety-net hospital,	The mandate resulted in significant staffing improvements, on average nearly a full patient per nurse fewer (-0.98) for all California hospitals. The greatest effect was in those hospitals with the lowest staffing levels at the outset, both safety-net and non-safety-net hospitals, as the legislation intended. The mandate let to significantly improved staffing levels for safety-net hospitals, although there was a small but significant difference in the effect on staffing levels of safety-net and non-safety-net hospitals. Regarding skill mix, a marginally higher proportion of

Author/Citation	Purpose	Sample	Type of Study/Methods	Strengths/Limitations	Results/Key Findings
<p>Inc, Mar. 2012, www.ncbi.nlm.nih.gov/pmc/articles/PMC3371663/.</p>				<p>chosen definition can influence the results</p>	<p>registered nurses was seen in non-safety-net hospitals following the mandate, while the skill mix remained essentially unchanged for safety-net hospitals. The difference between the two groups of hospitals was not significant.</p> <p>California's mandate improved staffing for all hospitals, including safety-net hospitals. Furthermore, improvement did not come at the cost of a reduced skill mix, as was feared. Alternative and more targeted designs, however, might yield further improvement for safety-net hospitals and reduce potential disparities in the staffing and skill mix of safety-net and non-safety-net hospitals.</p>