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The Relationship between Nurses' Work Environment and Patient Satisfaction

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The Relationship between Nurses' Work Environment and Patient Satisfaction

Abstract

Background: Patient satisfaction has become an area of interest among health care organizations since the early 2000s when Crossing the Quality Chasm identified patient-centered care as one of the six areas in need of improvement within the U.S health care system (Institute of Medicine, 2001). As a result of this report, hospitals are reimbursed based on patient satisfaction. Hospitals with low satisfaction scores are at risk of losing $500,000 to $850,000 annually.

Objective: To evaluate the relationship between nurses’ perception of their work environment and patient satisfaction in a sample of nurses in Upstate New York.

Methods: A sample of nurses’ in Western New York was obtained through the Genesee Valley Nurses’ Association (GVNA). The survey completed by the nurses was composed of demographic questions; the Practice Environment Scale-Nursing Work Index (PES-NWI), which is used to evaluate perception of nurses’ work environment; and questions to assess perception of patient satisfaction on their unit.

Results: Nurses who perceived that they always listened carefully when speaking with patients were more likely to have a higher perception of their quality of care, along with a better perception of their participation in hospital affairs. In addition, nurses who would definitely or probably recommend their unit to family and friends had a positive perception on three of the five PES-NWI subscales. Finally, nurses who always listen carefully when speaking with patients and those that would definitely recommend their unit had a higher perception of their overall work environment as evaluated by the PES-NWI.

Conclusion: Nurses’ with a more favorable perception of patient satisfaction on their unit were more likely to have a better perception of four of the five PES-NWI subscales. The only subscale that showed no difference between patient satisfaction and work environment was nurse-physician relationships. Therefore, if hospitals in Western New York are aiming to improve their patient satisfaction, focus should be placed on improving nurses’ participation in hospital affairs, quality of nursing care, quality of nurse managers, and improving staffing and resource adequacy.

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Nancy Wilk

Second Supervisor
Heather Minton

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Advisor Signature: Dr. Nancy Williams
Date: 4/10/18

This capstone fulfills the requirements of capstone seminars and assists in meeting the program outcomes for the MS in Advanced Practice Nursing degree from the Wegmans School of Nursing at St. John Fisher College.

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COURSE: GNDR 559

PROFESSOR: Dr. Will and Dr. McGrane Minton

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Carissa Williams
St. John Fisher College

Dear Ms. Williams:

Thank you for submitting your research proposal to the Institutional Review Board.

I am pleased to inform you that the Board has approved your Expedited Review project, "Relationship between Nurses' Work Environment and Patient Satisfaction in the Emergency Department."

Following federal guidelines, research related records should be maintained in a secure area for three years following the completion of the project at which time they may be destroyed.

Should you have any questions about this process or your responsibilities, please contact me at irb@sfc.edu.

Sincerely,

Eileen Lynd-Balta

Eileen Lynd-Balta, Ph.D.
Chair, Institutional Review Board

ELB: jdr
Appendix F

Informed Consent

Title of Study: The Relationship between Nurses’ Work Environment and Perception of Patient Satisfaction

Name of Researcher: Carissa A. Williams

Faculty Supervisor: Dr. Nancy Wilk

Purpose of Study: The purpose of this study is to analyze the relationship between the nurses’ work environment and nurses’ perception of patient satisfaction in a sample of local nurses. The secondary purpose of this research is to discover if a relationship exist between nurses’ perception of their work environment and patient care based on demographic factors.

Place of Study: A survey will be distributed via the internet and Survey Monkey through GVNA.

Length of Participation: Survey in anticipated to take nurses’ approximately 15 minutes

Risk and benefit: Possible risk associated with this study include mental fatigue and loss of time for completion of survey.

Protection of privacy/confidentiality: At no time will the nurses be asked to identify themselves. Survey Monkey provides confidentiality to respondents.

Your rights: As a research participant, you have the right to:
1. Have the purpose of the study, and the expected risks and benefits fully explained to you before you choose to participate.
2. Withdraw from participation at any time without penalty
3. Refuse to answer a particular question without penalty
4. Be informed of appropriate alternative procedures or courses of treatment, if any, that might be advantageous to you.
5. Be informed of the results of the study

I have read the above, received a copy of this form, and I agree to participate in the above-named study.

If you have any further questions regarding this study, please contact the researcher listed above. If you experience emotional or physical discomfort due to participation in this study, please contact the Health and Wellness Center at (585) 385-8280 for appropriate referrals. The Institutional Review Board (IRB) of St. John Fisher College has reviewed this project. For any concerns regarding this study and/or if you experience any physical or emotional discomfort, you can contact Jill Rathbun by phone at 585.385.8012 or by email at: irb@sjfc.edu.
THE RELATIONSHIP BETWEEN NURSES PERCEPTION OF THEIR WORK ENVIRONMENT AND PATIENT SATISFACTION

By: Carissa Williams, RN

BACKGROUND

- Early 2000's: Crossing the Quality Chasm identified patient-centered care as one of the 6 areas in need of improvement
- Affordable Care Act established the Value Based Purchasing program, which is an initiative by Centers for Medicare and Medicaid Services to incentivize hospitals based on quality of care given to Medicare patients
  - Hospitals with low patient satisfaction are at risk of a 2% reduction in payment
  - 2% = $500,000 to $600,000 annually

LITERATURE REVIEW

- Previous researchers have analyzed the relationship in medical/surgical units and ICUs
- Concluded:
  - Nurses perception of their work environment is correlated with patient satisfaction and nurse-assessed quality of care
  - Patients in hospitals with better work environments were more likely to rate their overall hospital experience high
  - Patients in hospitals with better work environments are more likely to recommend their hospital to family and friends

PURPOSE OF RESEARCH

To analyze the relationship between nurses' work environment and nurses perception of patient satisfaction in a local geographic region

HYPOTHESIS

Nurses with a more favorable perception of their work environment will also have a better perception of patient satisfaction

DATA AND METHODS

- Sample
  - Convenience sampling through The Genesee Valley Nurse Association
  - All members invited through an email
- Measures
  - Demographic data
    - age, years in nursing, years on unit, education, and previous environment
    - NPSNI
  - Nurse perceptions of hospital affairs, nursing leadership for quality of care, nurse manager's ability to support nurses, welcoming and consistent environment, and external non-physical environment
  - Patient Satisfaction
    - Treat patients with courtesy, respect, care; listen carefully to what patient is asking; information given to patients about care is easy to understand, and if they would recommend their unit to family/friends

DATA ANALYSIS

- SPSS version 24
- For each respondent, five subscales and entire scale were examined
- Descriptive statistics
  - Demographic variables
- Inferential statistics
  - Independent samples t-test
  - Analysis of variance
  - Bonferroni post-hoc tests
REFERENCES


REFERENCES


The Relationship between Nurses’ Work Environment and Perception of Patient Satisfaction

By

Carissa Williams, RN, BSN

Submitted in partial fulfillment of the requirements for the degree

Master’s in Advanced Practice Nursing

Supervised by

Dr. Nancy Wilk and Dr. Heather McGrane Minton

Wegmans School of Nursing

St. John Fisher College

April 2018
physician relationships. Therefore, if hospitals in Western New York are aiming to improve their patient satisfaction, focus should be placed on improving nurses’ participation in hospital affairs, quality of nursing care, quality of nurse managers, and improving staffing and resource adequacy.
hospital reimbursement. The nurses’ work environment can inhibit the ability to ensure patient satisfaction, which has prompted significant research regarding the relationship between nurses’ work environment and patient satisfaction.

Previous research has analyzed the relationship between nurses’ perception of their work environment and patient satisfaction on medical/surgical units and intensive care units (ICUs). These researchers concluded that nurses’ perception of their work environment is correlated with patient satisfaction and nurse-assessed quality of care (Aiken et al., 2012; Boev, 2012; Chen, Koren, Munroe, & Yao, 2014; Friese, 2005; Hinno, Partanen, & Vehvilainen, 2011; Kieft, Brouwer, Francke, & Delnoij, 2014; Kutney-Lee et al., 2009; Smith, 2014; Tervo-Heikkinen, Partanen, Aalto, & Vehvilainen, 2008; Van-Bogaert et al., 2013; You, et al., 2013). Patients in hospitals with better work environments were more likely to rate their overall hospital experience highly, as well as report positive communication amongst nurses on the HCAHPS survey (Aiken et al., 2012; Chen et al., 2014; Kutney-Lee et al., 2009; Smith, 2014; You et al., 2013). If a hospital is classified as having a healthy work environment, patients are also more likely to recommend the hospital on the HCAHPS survey (Aiken et al., 2012; Chen et al., 2014; Kutney-Lee et al., 2009; Smith, 2014).

**Purpose**

The purpose of this research is to analyze the relationship between the nurses’ work environment and nurses’ perception of patient satisfaction in a sample of nurses obtained from the Genesee Valley Nurse Association (GVNA). It is hypothesized that nurses with a higher perception of patient satisfaction will also have a better perception of their work environment.

**Data and Methods**

**Sample**
multiple studies and is considered to be highly reliable and valid for measuring nurses work environment (Lake, 2002).

**Patient Satisfaction.** The final section of the survey evaluated nurses’ perception of patient satisfaction on their unit. The patient satisfaction questions were derived from the HCAHPS survey because this is a national, standardized survey used to measure patients’ satisfaction with hospital care. The five questions used to evaluate nurses perception of patients’ satisfaction on their unit included asking if nurses on their unit treat patients with courtesy and respect, listen carefully to what patients say, explain medications prior to administering, explain things in a way patients would understand, and likelihood of recommending their unit to friends and family. Nurses rated their perception of the first four questions on a four point Likert Scale of 1 (*never*) to 4 (*always*). Nurses rated if they would recommend their unit to friends and family on a four point Likert scale of 1 (*definitely no*) to 4 (*definitely yes*).

**Data Analysis**

Data was analyzed using the Statistical Package for the Social Sciences version 24 (IBM SPSS, version 24). For each respondent, subscales and entire scale responses were examined. Descriptive statistics was conducted for demographic variables. Independent samples t-test, analysis of variance (ANOVA), and Bonferroni post-hoc tests were used to evaluate the relationship between nurses work environment and nurses’ perception of patient satisfaction.

**Results**

The final sample consisted of 31 registered nurses mostly with bachelor degrees, who worked on their current unit between 4 months and 5 years (see Table 1). Practice environments for the nurses were diverse, with the majority of nurses working in intensive care units (7, 22.6%), inpatient units (6, 19.3%), and outpatient units (6, 19.3%; see Appendix A). Table two
revealed a significant difference in nurses’ participation in hospital affairs between those who said they would probably recommend the unit and those who would probably not recommend the unit (Mean Diff=0.93, SE= 0.33, p=0.029).

An ANOVA revealed a significant difference for nurses’ perception of their quality of care between nurses who would definitely, probably, and probably not recommend the unit to family and friends (F(2,28)=4.23, p=0.025). Bonferroni post-hoc tests revealed significant differences for quality of care between nurses who would definitely recommend the unit and those who would probably recommend the unit (Mean Diff=0.69, SE= 0.25, p=0.03), as well as between nurses who would probably recommend the unit and those who would probably not recommend the unit (Mean Diff=0.77, SE= 0.30, p=0.045).

An ANOVA also revealed a significant difference between nurses’ perception of their nurse manager and their likelihood to recommend their unit to family and friends (F(2,28)=6.33, p=0.005). Bonferroni post-hoc tests revealed significant differences in nurse managers’ ability to support staff between nurses who would definitely recommend the unit and those who would probably not recommend the unit (Mean Diff=1.09, SE= 0.31, p=0.004), as well as between those who would probably recommend the unit and those who would probably not (Mean Diff=1.01, SE= 0.37, p=0.029).

An ANOVA also found a statistical difference between staffing and resource adequacy and likelihood of recommending the unit (F(2,28)=4.36, p=0.022). Furthermore, the Bonferroni post-hoc found a statistical significance between those who would definitely recommended the hospital and those who would probably not recommend the hospital (Mean Diff=0.92, SE= 0.33, p=0.03).
al., 2014; Kutney-Lee et al., 2009; Smith, 2014; You et al., 2013). This is similar to what was determined from this research; nurses who reported they always listen to what patients say had a more favorable perception on two of the five PES-NWI subscales.

This study suggested that nurses who were more likely to recommend their unit to family and friends had a more favorable perception of three of the five PES-NWI subscales including participation in hospital affairs, nurses’ managers ability, and staffing and resource adequacy. This is similar to what previous researchers had determined. If hospitals were classified as having a healthy work environment, patients were more likely to recommend the hospital to family and friends (Aiken et al., 2012; Chen et al., 2014; Kutney-Lee et al., 2009; Smith, 2014).

Overall, this study suggested that nurses with a better perception of patient satisfaction had a more favorable perception of their work environment on four of the five PES-NWI subscales. The only subscale that showed no difference between patient satisfaction and work environment was the nurse-physician relationship. Therefore, if hospitals in Western New York are aiming to improve patient satisfaction, focus should be placed on improving nurses’ participation in hospital affairs, quality of nursing care, quality of nurse managers, and improving staffing and resource adequacy.

**Study Limitation**

A cross-sectional design was a limitation to this study because conclusions cannot be made regarding causation. In addition, the sample size was limited to 31 respondents, which is underpowered since the Bonferroni post-hoc test was unable to identify a difference amongst groups for two separate measures. Finally, there was a wide diversity of work environments which limits the ability to make generalized statements regarding specific care areas.
References


Table 2: Satisfaction (N=31)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Never n (%)</th>
<th>Sometimes n (%)</th>
<th>Usually n (%)</th>
<th>Always n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treat patient with courtesy and respect</td>
<td>-</td>
<td>1 (3.2)</td>
<td>16 (51.6)</td>
<td>14 (45.2)</td>
</tr>
<tr>
<td>Listen carefully to what patients say</td>
<td>-</td>
<td>-</td>
<td>21 (67.7)</td>
<td>10 (32.3)</td>
</tr>
<tr>
<td>Explain medications to patients</td>
<td>-</td>
<td>4 (12.9)</td>
<td>10 (32.3)</td>
<td>17 (54.8)</td>
</tr>
<tr>
<td>Explain in a way patient can understand</td>
<td>-</td>
<td>2 (6.5)</td>
<td>22 (71.0)</td>
<td>7 (22.6)</td>
</tr>
<tr>
<td>Recommend unit to friends/family</td>
<td>Def. No n%</td>
<td>Probably No n%</td>
<td>Probably Yes n%</td>
<td>Def Yes n%</td>
</tr>
</tbody>
</table>


Literature Matrix 1

Foundation of Nursing Research

Carissa Williams
in medical, surgical, intensive care unit, operating room or adult and pediatric care units.
There were 12 questionnaires excluded from the study because of excessive missing data. Therefore the number of questionnaires analyzed was 1201 from 116 nursing units.
The response rate from the hospital varied from 44% to 74%. The number from each hospital that responded was 244 from general hospital
440 from university hospital
517 from hospital group
There was no exclusion criteria identified in the article. The researcher only excluded questionnaires if excessive data was missing.

Sample Characteristics
Demographic information obtained through the questionnaire included age, gender, years in nursing, years on present units, qualification, and work schedule. The following include the mean with standard deviation (SD) for demographics obtained.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>38.3</td>
<td>10.3</td>
</tr>
<tr>
<td>Years in nursing</td>
<td>15.3</td>
<td>10.3</td>
</tr>
<tr>
<td>Years on present unit</td>
<td>9.5</td>
<td>8.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>85.2%</td>
</tr>
<tr>
<td>Baccalaureate Degree</td>
<td>76.5%</td>
</tr>
<tr>
<td>Master Degree</td>
<td>1.8%</td>
</tr>
<tr>
<td>Working regime-50% or less of full time position</td>
<td>29.8%</td>
</tr>
<tr>
<td>Working regime-75% or more of a full-time position</td>
<td>60.1%</td>
</tr>
</tbody>
</table>

In addition, all nurses in the study were registered nurse working on the units mentioned above.

Yr. Data Collected
Data collection occurred between June 2011 and June 2012. The researchers did not include in the article how long the nurses had to complete to questionnaire.

Study Design
The design used was a cross-sectional study. The participants were asked to fill out one questionnaire one time. The survey was comprised of demographic questions and well-established field test measure. The researchers used the following test for their analysis.

<table>
<thead>
<tr>
<th>Characteristic being Measured</th>
<th>Tested used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice environment</td>
<td>Revised Nursing Work Index</td>
</tr>
<tr>
<td>Burnout</td>
<td>Maslach Burnout Inventory Human Service Survey</td>
</tr>
<tr>
<td>Workload</td>
<td>Intensity of Labour Scale</td>
</tr>
<tr>
<td>Decisional Latitude</td>
<td>Seven-item measurement instrument</td>
</tr>
</tbody>
</table>
With the exception of two measures of decision latitude and social capital, all other multi-item test were previously evaluated and confirmed with factor analysis and internal consistency analysis. In addition, for all multi-item scales the researchers performed model testing for the current study sample to previous studied. The Revised Nursing Work Index, Maslach Burnout Inventory Human Service Survey, Intensity of Labour Scale, decision latitude, and social capital all had comparative fit index (CFI) and incremental fit index (IFI) to be great than 90 and root square error of approximation (RMSEA) to be less than 08. According to the values, these tests were found to be a reasonable fit. In addition, the researchers computed Cronbach alpha coefficients for all the scales. The Cronbach alpha coefficient for all scales ranged between .65 and .90 except for the job outcome dimension (.32). Therefore, the researchers performed an alternative measurement technique, inter-item correlation, for the job outcome dimension which resulted in a value ranging between .15 and .21 which were assess as fair to moderate.

All variables, except workload, emotional exhaustion, and depersonalization were coded for analysis so that higher scores indicated more favorable rating. Emotional exhaustion, depersonalization, and workload were coded so that higher scores were suggestive of unfavorable perception or conditions.

Once the data was obtained, AMOS software was used to conduct model testing. Measures from the data sample were compared to acceptable criteria level (CFI and IFI greater than or equal to .90 and RMSEA less than 080). In addition, researchers analyzed hypothesized pathways. Pathways were included/excluded based on chi-square statistics and empirical and theoretical grounds.

<table>
<thead>
<tr>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>The results of the demographic data were previously described. The majority of the sample were female (85.2%) and held a baccalaureate degree (76.5%). The average age, nursing experience, and time worked on the current unit were 38.3, 15.3, and 9.5 years, respectively. Of the 1201 respondents, 8.3% were dissatisfied with their job, 5.9% intended to leave the hospital within the next year, and 10.9% intended on leaving the nursing profession. The respondents were asked about their nursing-assessed quality of care on the unit level and on their last shift. 87.2% of respondents rated there nurse-assessed quality of care as good or excellent for their unit level. In addition, 90.6% of respondents rated their nurse-assessed quality of care as good or excellent on their last shift. Although these values were high, approximately 40% indicated the quality of care had declined over the past year. Respondents had favorably ratings for nurse-physician relations, nurse management at the unit level, decisional latitude, and social capital. On average respondents had unfavorable ratings for hospital management &amp; support and work load. Additional results include: 34% of respondents rated high to very high range of emotional exhaustion. 18.7% of respondents rated high to very high on depersonalization dimension 7.8% of respondents scored low or very low on personal accomplishment</td>
</tr>
</tbody>
</table>

Factors that build upon each other to make nurses fell burned out, which ultimately affects their perceived nurse-assessed quality of care. In addition, this article points out the fact that nurse managers on the unit level have many direct effects on the nurse outcome (ex. Nurse-assessed quality of care, decisional latitude, job outcomes, and social capital). With a strong support system from nurse managers there will be a direct positive outcome for nurse-assessed quality of care and job outcomes. In addition, with a strong supportive nurse manager on the units there will be a positive relationship with decisional latitude and social capital which ultimately enhances the personal accomplishment dimension of burnout leading to better outcome variables. Ultimately, this article could help hospitals out by being a foundation for education to nurse managers at the unit level. By educating nurse managers about how the relationships within the nurse practice environment affects outcome variables, nurse managers can provider an environment that fosters decisional latitude and social capital. By ensuring decisional latitude and social capital are met within a unit, nurse will experience higher personal accomplishment which has both a positive effect on the nurse-assessed quality of care and job outcome.

| Strength/Weaknesses | Strength: Convenience sampling was used in this study. Based on the article, registered nurses working in the medical, surgical, intensive care unit, operating room or adult pediatric care units at either the general hospital, university hospital, or group hospital were asked to participate in the study. This is a strength because bias is eliminated since everyone working in these areas was asked to participate in the study. Since this was a cross-sectional survey, there was less threat to internal validity. Threats that could be eliminated with internal validity include maturation, pretest/posttest, and mortality. The researcher also selected a well diverse sample, which would increase ones confidence in generalizing the results to the population. The total sample size was 1201 acute care registered nurses, from 8 different hospitals, on 116 different units, in different parts of Belgium (Dutch and French speaking sections). Another strength to the study was all pathways were statistically significant (p<05) with the improved structural equation model. In addition, a fit testing was done for the structural equation model resulting with CFI=.904, IRI=.904 and RMSEA=.43 which was considered adequate. An additional strength to this article was that all the multi-item measures were previously explored and confirmed for factor analysis and internal consistency analysis, indicating the measurements have validity and reliability. In addition, these multi-item measures had Cronbach alpha between .65 and .90, which is adequate. Finally, with a coefficient of determination for the outcome variables was 47% for nurse-assessed quality of care and 54% for job outcomes.

Weaknesses: In terms of internal validity some weaknesses with this study include instrumentation and selection bias. Since a questionnaire was used, the respondent may have comprehended a question differently than it was intended to be asked. In addition, selection bias is a threat to internal validity because respondent volunteered themselves to be in the study. An additional weakness is the researcher did not say how long they gave the respondents to fill out the questionnaire. The respondents last shift at work could skew how
Literature Matrix 2

Foundation of Nursing Research

Carissa Williams
| Sample Characteristics | An inclusion criteria for European nurses to participate in the study was that they had to be a “qualified professional nurse by the standards of each country” that had direct patient care on the selected medical and surgical units. Inclusion criteria for European patients to participate in the study included “all patients able to participate and understood one of the questionnaire language”. However, the article does not elaborate on what is meant by “able to participate”. The article did state however that the nurses and patients were surveyed from the same units.  
Demographics were not listed in the article. Therefore, it is hard to tell if all the countries had the same sample characteristics. However, for one piece of the study (effects of nurse staffing and practice environment on nurse outcome), the researchers controlled for hospital characteristics, nurse characteristic, and specialty of unit, which indicates this information was obtain just not present in the article. Some sample characteristics include:
- Average number of nurses per hospital surveyed in Europe was 65, with a range of 5-467. In the US the average was 45 with a range of 10-242.
- The average patient per hospital surveyed in the European countries 49. |
| Yr. Data Collected | The data from the European hospitals were obtained between 2009 and 2010. The data was obtained from the US between 2006 and 2007. In addition, the data collected was for a different study. The results in this study were used as a comparison. |
| Study Design | The design that was used for this study was a cross-sectional design, a type of quantitative. Therefore nurses and patients filled out a survey at one point in time. The surveys were comprised of well-established field test measures. The same nurse and patient surveys were used for all countries. The following table |
intention to leave job, quality of care on their last shift (fair or poor/good or excellent), confident/less than confident patient could manage their own care when discharged, and confident/less then confident that hospital management would resolve patient care problems

- An item from the Agency for Healthcare Research and Quality’s hospital survey on patient safety culture was used to assess safety. The nurses gave an overall grade for safety on their unit.
- Nurses were asked if they would recommend the hospital

Patient satisfaction was measured using the Hospital Consumer Assessment of Healthcare Providers and System. This instrument was comprised of the following pieces.

- Patients rated the hospital on a scale of 0 to 10, with 10 being the best.
- Patients indicated if they would recommend their hospital to family and friends.
- A composite measure of satisfaction with nursing was derived from three items asking if patient always treated them with respect, listened carefully, and explained things in a clear manner.

| Data Analysis Method | The unit of analysis used for this study was hospitals although the unit of observation was individual nurses and patients. The data was analyzed with and without controls. The researchers controlled for hospital characteristics such as size, teaching status, and technology (open heart or/and organ transplants were defined as high technology). The researchers used an adjusted regression analysis (odds ratio) to analyze nurse outcomes (adjusted for age, sex, full time employment status and specialty) by a multilevel model structure in which nurses were nested within hospitals and countries. In addition, the researchers used a similar approach for analyzing patient outcomes with the patient data obtained in Europe. The researchers noted that they made “similar adjustments” using a multilevel model nesting patient within the hospitals and countries. Odd ratio for US hospitals were estimated “about” the mean odds ratio using coefficients from linear regression model, since individual data were not available. Robust logistic regression with clustering of nurse and patient into hospitals was also used. The article reports that this method yielded the same results because of hierarchical modelling and the results were more straight forward to interpret. Nurse staffing was calculated based on the nurse survey. Nurses were asked what the patient to nurse ratio was on the unit for the nurse’s last shift. Lower ratios indicated better staffing. |
| Results | The average of patients to nurses was used to assess nurse workload. The range for this ratio for the European countries was 5.4 to 13.0 in Norway and Germany, respectively. The ratio of patient to nurses in the US was 5.3. Aside from just assessing the ratio of patient to nurses they also analyzed the ratio of patients to total staff (registered nurses and non-registered nurses). The range |
Both the nurse and patient survey asked respondents if they would recommend the hospital. The researcher depicted these results on a scatterplot. The results of this suggested that nurses and patient differed on recommending the hospital. However, nurses and patients seemed to be in agreement on which hospitals provided good care.

The researchers estimated the effects of the nurses' practice environment and staffing on several nurse outcomes and reports of quality and safety. This was estimated using robust logistic regression. The researchers analyze the effects of the nursing practice environment/staffing on nurse outcomes with and without controls. Based on the results from this portion of the study, in both Europe and the US an improved work environment had a favorable influence on nurse outcomes, with and without adjusting for the controls.

Researchers concluded that nurses in hospitals with better work environment were half as likely to report poor or fair quality of care and to give their hospital poor to failing grade on patient safety. In addition, for each additional patient per nurse, there was an increase in the likelihood the nurse would report poor/fair quality of care and poor/failing safety grade. The following table is the adjusted odds ratio for these values.

<table>
<thead>
<tr>
<th>Nurse outcome</th>
<th>Europe Adjusted OR (95% CI)</th>
<th>US Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor/fair quality of care</td>
<td>Practice Environment</td>
<td>0.56 (0.55-0.63)</td>
</tr>
<tr>
<td></td>
<td>Staffing</td>
<td>1.11 (1.07-1.15)</td>
</tr>
<tr>
<td>Poor/failing safety grade</td>
<td>Practice Environment</td>
<td>0.50 (0.43-0.57)</td>
</tr>
<tr>
<td></td>
<td>Staffing</td>
<td>1.1 (1.05-1.16)</td>
</tr>
</tbody>
</table>

The other nurse outcomes that were assessed included burnout, job dissatisfaction, intention to leave job within the next year, not confident patient can manage their own care after leaving the hospital, and not confident the hospital management would resolve patient problems. All the nurse outcomes had similar association with effect. In addition, the work environment effect was generally stronger than the staffing effect.

The final outcomes that this research analyzed was how separate nursing factors and characteristics affected patient ratings (patient rating hospital highly, patient indicating they would definitely recommend the hospital, and patient reported favorable nursing communication). The results from this analysis included:

- In both Europe and the US, patients in hospitals with better work environments were more likely to rate the hospital highly and recommend the hospital.
- Patients in hospitals with higher ratios of patients to nurses were less likely to rate the hospital highly and recommend the hospital.
• The questions used to obtain data were from well-known sources which improves validity and reliability.
• The same nurse and patient survey instruments were used in all countries. This eliminates the internal threat on instrumentation.

Weaknesses:
• One weakness is that the study compared Europe and the US. This is a weakness because the data was collected differently between the two countries. In Europe, the patients received questionnaires while they were still in the hospital. In the US, the patients did the questionnaires after leaving the hospital. In addition, all the hospitals in Europe collected data on medical/surgical units whereas the data collected from the US was across any unit.
• Another weakness to the study is that the researcher did not use an inclusion/exclusion criteria for patient questionnaires. If a patient had only been in the hospital for a day vs two weeks could change their responses to the question. In addition, the researchers should have elaborated on the statement “the patient survey involved all patients able to participate”.
• Due to money constraints, many of the countries did not participate in patient questionnaires.
• Since questionnaires were used for this study, individuals volunteered. When individuals volunteer there is a concern for selection bias, which minimizes internal validity.
• Cross sectional design was used. This indicates that causality cannot be established. In addition, it only looks at one specific point in time.
• The sample of US nurses was obtained via the nurses’ licensure list. The article does not state if there were exclusion criteria (ex. RN or LPN). Also, not all nurses’ work in a hospital, some work in nursing homes, primary care office etc. Since the research did not states which type of nurses were included vs excluded this weakens the ability to compare the European and US results.
Literature Matrix 3

Foundation of Nursing Research

Carissa Williams
nurse surveys. In addition, the researchers states that the average response rate for HCAHPS across hospitals in this sample was 34 percent.

| Sample Characteristics | Demographic for the nurses and patients were not reported in the study. However, since the researchers used a two-stage sampling design for the nurses, the researchers mentioned “a few differences were noted in some nonresponders’ demographic characteristics when compared with the first sample; however, there was no evidence of response bias in the hospital measures of interest.” The researcher do mentioned that they randomly sampled registered nurses from the licensure list. There percent of nurses sampled from each state are as followed:
- California-40 percent
- Pennsylvania-40 percent
- New Jersey-50 percent
- Florida-30 percent

Once the surveys were collected and analyzed for both the patients and nurses, the researcher categories hospitals by work environment quality. Hospitals were categorized by the results of the Practice Environment Scale of the Nursing Work Index (PES-NWI). The hospital was classified as “better” if threes subscales were above the median, “mixed” if one or two subscales were above the median, and “poor” if no subscales were above the median. Of the 430 acute hospitals analyzed for this study, following illustrates the number of hospitals for each work environment quality:
- Better: 127 hospitals
- Mixed: 173 hospitals
- Poor: 130 hospitals

Exhibit 1 illustrate the hospital characteristic for each work environment quality. The hospital characteristics that were analyzed include patients per nurse, bed size, teaching status, core-based statistical area, and ownership. No sample characteristics were listed for the patients surveyed.

| Yr. Data Collected | HCAHPS data was collected between October 2006 and June 2007. The hospital characteristic data was obtained from the 2005 American Hospital Association (AHA) Annual Survey. The data regarding the nurses’ survey was collected between 2006 and 2007.

| Study Design | The design that was used for this study was a cross-sectional design, a type of quantitative design. The data was collected in three different ways: the national HCAHPS survey, a four-states nurse survey of hospital quality, and the American Hospital Association (AHA) Annual survey.

The nurse work environment was measured using three of the five subscales of the Practice Environment Scale of the Nursing Work Index (PES-NWI). The subscales used included items related to nursing leadership, nursing standards for high-quality patient care, and nurse physician relationships.
### Data Analysis Method

The medians of the three subscales for the Practice Environment Scale of Nursing Work Index were used to classify hospitals as having "better" (three subscale above the median), "mixed" (one or two subscales above the median), or "poor" (no subscales above the median) nursing work environments. The nurse staffing was measured by calculating the average number of patients cared for by all RNs in each hospital on their last shift.

The distribution of nurse staffing, work environment, other hospital characteristics, and each HCAHPS measure were examined from the full sample, as well as for the subsample of hospitals in each nurse-work environment category (better, mixed, poor).

Ordinary least square regression models were used to estimate the effect of the nurse work environment on each HCAHPS outcome, before and after adjusting for unmeasured differences across the four states using dummy variables, hospital characteristics (size, teaching status, ownership and core-based statistical area) and patient response rate to HCAHPS.

Linear regression models were used to estimate the unadjusted and adjusted joint effects of nurse work environment and patient-to-nurse staffing ratios on HCAHPS outcome.

P values were generated from analysis of variance for staffing variables and from chi-square for categorical variables, except for the core-based statistical area variable, where Fisher’s exact test was used for cell counts of less than 5.

### Results

The first result that this study analyzed was the hospital characteristic for each work environment quality. The work environment quality was categorized as poor, mixed, or better based on the nurses’ answer to the PES-NWI. To determine which hospital fit into which category, the researchers looked at the median of the three subscale from PES-NWI. If all three subscales were above the median the hospital was classified as better, if one or two subscale was above the median the hospital was classified as mixed, and if no subscales were above the median the hospital was classified as poor. Some results of this portion of the study include:

- Of the total 430 hospitals in the study, 130 hospitals were classified as poor, 173 hospitals were classified as mixed, and 127 were classified as better.
- The average patient per nurse for each work environment quality and total sample are as followed. The p value for this analysis was <.001, indicating there was a statistical difference.
  - All: 4.9 (1.0)
  - Poor: 5.3 (1.1)
  - Mixed: 4.9 (1.0)
  - Better: 4.6 (0.9)
- There was no statistical difference between bed size or teaching status and work environment quality. The p value for these analysis was >.05.
The researchers states “that hospitals that would improve their nurse work environment from poor to better and reduce nurses’ workload by one patient would be expected to move, in terms of the percentage of patient who would definitely recommend their hospital from the sixteenth percentile to the fiftieth (or from the fiftieth percentile to the eighty-fourth) in this distribution of hospitals.”

### Implications

Hospitals are being incentivized for increased patient satisfaction. This study illustrates that improved work environment quality has a positive correlation with nine of the ten HCAHPS outcome. In addition, nurse staffing had a positive correlation with three of the outcomes. Therefore, when hospitals are trying to improve their patient satisfaction a main place to start is with the work environment quality and nurse-patient ratio, since these had the greatest effect on patient satisfaction. Although it may cost more money upfront for a hospital to improve the work environment quality and decrease the nurse-patient ratio, in the long run the hospital will save money by being incentivized for increasing patient satisfaction.

In addition, the researcher mention that hospitals in the sample (that reported HCAHPS surveys) had slightly better and less variable nurse-staffing levels than hospitals that did not report, which could be an explanation for why there was not as high of a staffing effect on all HCAHPS outcomes. With this being said, now that a few years has passed since the study was performed, it would be interesting to analyze this again to see if staffing has a greater effect on HCAHPS outcomes.

### Strength/Weaknesses

**Strength:**
- Random sampling was used to obtain the nurse sample. The researchers randomly sampled nurse from four state licensure list. By using random sampling this helps eliminate selection bias. In addition, this strengthens external validity.
- Sampling nurses to obtain hospital information diminishes bias at the hospital level, which is a potential threat when analyzing hospital performance.
- They controlled for hospital characteristics that preliminary reports suggested that HCAHPS scores differed by.
- Since this was a cross-sectional design, respondents only participated at one point in time. This increases internal validity by eliminating maturation, testing effect, and mortality.
- The surveys used included questions from the PES-NWI and HCAHPS. These are two well established test which improves validity and reliability.
- The sample sized used was large, 430 hospitals and 20,984 nurse which strengthens external validity.

**Weakness:**
- Since this was a cross-sectional design, there is no information regarding causation, just relationships. The researchers suggested doing a longitudinal analysis for assessing causality as well as potential unmeasured variables.
Literature Matrix 4

Foundation of Nursing Research

Carissa Williams
- In what way do nurses effect experiences of the patient?
- What are inhibiting or facilitating factors?

**Topics**
- Clinically competent nurses
- Adequate staffing
- Nurse-physician relationship
- Autonomous nursing practice
- Nurse manager support
- Control over nursing practice
- Support for education
- A culture that values concerns for patients

**Data Collection Method**
Nurses were recruited to participate in this study by purposeful sampling. The researchers recruit organizations participating in a Dutch program called “Excellent Care”. The program directors was asked to recruit nurses for the focus groups. Researcher conducted focus groups in attempt to elicit ideas, thoughts and perceptions from nurses about patient experiences and how nurses can improve these experiences. A total of four focus groups were used. Each focus group lasted two hours. Inclusion criteria to participate in the study included:
- Participants had to be employed as a registered nurse or certified nursing assistant
- Participants must have worked as nurses for at least two years
- Participants must be operative in mental health care, hospital care, home care or nursing home care.

The focus groups were led by two researchers. One researcher facilitated the interview which the other observed and monitored the process. Upon the completion of the focus groups, the researchers reflected on the process in order to examine the equality of the meeting and allow the dissection of different view.

The researchers used an interview guide with predetermined topic areas. The sequencing of the questions depended on the process of the groups responses. When participants were discussing certain topics, the researchers used a non-directive approach. In addition, when certain topics were polarized, the researcher stimulated the discussion by introducing a new topic or question.

All focus groups and conversations were digitally recorded and then transcribed.

**Data Analysis Method**
The transcribed data from the focus groups were open coded and categorized. Several themes were extracted by organizing and structuring the categories. Interview fragments were constantly being compared. The final analysis were presented to the participants as a way of member check to make sure whether the researchers had adequately understood and interpreted the data. MaxQDA was a software that was used to support the coding ordering analysis.

**Themes**
Several themes emerged from this study. The researchers divided the themes into facilitating and inhibiting factors to improving patient
Participants believe that the number of nurses available influences how patients experience the quality of care. Although a specific number was not agreed upon, participants believe that a sufficient number of nurses should be determined on if patient's wishes and needs are met.

**Control over nursing practice**
This is defined as nurses being involved in nursing policy and nursing issues. In the view of the participants, nurses are not always in charge and cannot always make their own decisions about nursing issues which they believe affects the quality of nursing care.

**Managerial support**
Participants believe that managers should be aware of spirit, unity, handle conflict, be visible and be approachable. In addition, managers should ask for nursing opinion, therefore have regular contact. In addition, participants believe that managers should create the proper conditions for patient care meaning, arranging sufficient personnel, replacement staff and succession planning. Many of the participants believe that management is tied to a system for controlling costs which sometimes will go against how the nurse wants to care for their patient.

**Patient-centered care**
This is defined as “nursing care that is focused on patient needs and preferences and is intended to increase patient self-management and encourages improved health and recovery.” Nurses are the first ones to normally meet the patients and are with them most often through their care. Higher quality of nursing care is achieved when patients feel heard and understood, and consider themselves to be in safe hands.

**Inhibiting factors**
The participants talked about two inhibiting factors, cost-effectiveness and transparency & accountability that prevented them from improving patient experiences.

**Cost-effectiveness**
Organizational policies are directed towards efficient and effective deployment of people and resources. The participants talked about delegation of task to less qualified nurses in order to work effectively as possible and to achieve a higher productivity. In addition, participants have noticed that care is becoming more standardized. Finally, the workload is increasing along with work-associated pressure.

**Transparency & accountability goals**
Participants had noticed an increase in administrative workload to account for the quality and cost of care. The participants mentioned that monitoring and registering information is aimed at serving external accountability, such as health insurers and government, and not at improving nursing care.

| Findings/Implications | From the data obtained via the focus groups, the researchers concluded that the identified elements are consistent with the eight essentials of magnetism. One component of the essentials of magnetism is “nurse-physician relationships”. From the nurses that participated in this study, they believed the relationship with all members of the health care team were important, not just between nurses and physicians. |
| limitations section that one focus group per sector may have been insufficient. |
Literature Matrix 5

Foundation of Nursing Research

Carissa Williams
assess nurses’ rating of the presence of magnet attributes in their current job and the importance of each item to the nurse
  o 31 item instrument that measures the extent to which nurses rate the presence of magnet attributes in their current working environment. Nurse used Likert scale (score 1-4). PES-NWI items are reversed coded before data analysis.

PES-NWI: contains 5 subscales
- Nurse Participation in hospital affairs subscale reflect a participatory role and value status of nurses in a broad organization context (internal governance, decision making)...for this study this subscale was referred to as Nurse participation in dialysis provider affairs
- Subscale nursing foundation for quality of care emphasize a high standard of patient care.

***These two subscales combined reflect nurses’ perception of the presence of magnet attributes in the broader organizational environment**
- Nurse manager ability, leadership and support of nurse subscale focuses on the critical role of the nurse manager.
- Staffing and resource adequacy subscale describes having adequate staff and support resources to provide quality patient care
- Collegial nurse-physician relations subscale reflects positive working relationships between nurses and physicians

***these three subscales reflect nurses’ perception of the presence of magnet attributes in the unit environment***
- Subscale scores are calculated as average scores, with arrange of 1 to 4.
- Total PES-NWI score was calculated as a average of all subscales.
  o PES-NWI subscale below 2.5 is in disagreement...above 2.5 represents agreement.
- Alpha reliability
  o PES-NWI for non-nephrology nurses: 0.71-0.82
  o In nephrology nurses 0.81-0.87
  o For this study 0.85-0.96
- The predictive ability of the PES-NWI has been established in hospitals and dialysis setting.

- Nurse turnover: provided to the principal investigator by the human resource department of the dialysis company for the 3-month data collection of the first quarter of 2004 and a total year turnover for 2003.
  o Calculated by dividing the number of nurse termination by the number of average actively employed nurses with a year
- Intention to leave-asked in questionnaire...answered with yes or no
- Facility-level patient satisfaction-first quarter of 2004 were obtained via the principal investigator from the medical office of the dialysis company
  o Survey comprised of 35 items that were arranged into 7 scales: nurses, technicians, dieticians, social workers, nephrologist, dialysis clinic, and patient education...5 point Likert scale
  o Two facility-level patient satisfaction scores were used for this study: percent of patient reported satisfaction with overall care at
<table>
<thead>
<tr>
<th>Leadership and support of nurses</th>
<th>was a good leader and supported nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staffing and resource adequacy</td>
<td>Nurses agreed, somewhat, that staffing and resources for patient care was adequate</td>
</tr>
<tr>
<td>Collegial nurse physician relations</td>
<td>Nurses agreed their relations with physicians were collaborative</td>
</tr>
</tbody>
</table>

- Nurses were asked whether each PES-NWI item was important to them and their job. Each subscale was asked “is this important to you and your job?” Researchers determined the percent of individuals who answered “yes”
  - For the 31 item PES-NWI items, 23 items were affirmed as important by more than 90% of the nurses, and 29 of the items were affirmed as important by 80% of the nurses
  - Finding: staff nurses in dialysis environment affirm the importance of magnet characteristics in their work.

**Relationship of PES-NWI rating and outcomes**

**Intention to leave**

- Nearly 10% of nurses who responded to the question “do you plan to leave your job in the next year” indicated they wanted to leave job
- PES-NWI scores were significantly related to nurses’ intention to leave ($r = -0.254$, $p < 0.01$) that means lower overall rating of the work environment (disagreement that magnet characteristics were present) were significantly related to nurses’ intention to leave.
- Moreover, lower rating on the nurses’ participation in dialysis provider affairs ($r = 0.269$, $p < 0.01$), nurse manager ability, leadership and support of nurses subscale ($r = 0.346$, $p < 0.01$) and staffing and resource adequacy subscale ($r = 0.219$, $p < 0.01$) were significantly related to nurses intention to leave their job.
- $R$ is related to correlation coefficient. Correlation coefficient can be between -1 and 1.
- Independent $t$-test were computed to compare differences in PES-NWI average scores of nurses who intended to leave their job and those that did not (figure 1).
  - Nurses who planned to leave their job in the next year reported significantly lower mean scores, that is higher disagreement, on the Nurse participation in dialysis provider affairs subscale ($t = -3.60$, $p < 0.05$), nursing foundations for quality care ($t = -1.98$, $p < 0.05$), the nurse manager ability, leadership, and support of nurses subscale ($t = -3.30$, $p < 0.05$), and the staffing and resource adequacy ($t = -2.90$, $p < 0.05$) compared to nurses who did not plan to leave.
  - “Intend to leave group” also reported significantly lower mean scores for total PES-NWI ($t = -3.39$, $p < 0.05$) compared to nurses who did not intend to leave. There was no difference in the physician nurse relationship ($t = -0.515$, $p = 0.61$)
  - T test looks at if two groups means are different

Nurse turnover
<table>
<thead>
<tr>
<th>and support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse-physician relation</td>
</tr>
</tbody>
</table>

**Implications**

Findings from this study can help to identify potentially modifiable factors in the work environment that may be significantly related to negative nurse and patient outcomes.

**Strengths/Weaknesses**

**Strength**
- All part-time and full-time employees were able to participate
- Used a national dialysis company (weakness—does not say where the facilities were located...external validity)

**Weakness**
- Nurses in this study were recruited from a single dialysis organization—responses could have been influenced by an organization culture that is unique to the dialysis organization could have caused response bias
- Also participants were recruited by nurse managers, so there could be bias in the participants that the nurse manager selected.

**briefly skimmed discussion section**
Literature Matrix 6

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• Designed to measure characteristics within the nursing practice environment. This is a modification from the original NWI. NWI was based on the original magnet hospital characteristics which explored common attributes of hospitals that were successful in recruiting and retaining nurses amidst a serious nursing shortage in the 80's. This modified subscale contains 31 items. Also this subscale is highly reliable and valid measure of the nurse practice environment.

• From the original study, where these data were drawn, the PES-NWI was incorporated in the nurse perception survey (NPS), which contained five instruments that measure various aspects of the work environment. When incorporated in the NPS, four items from the original instrument (the collaborative practice items) were deleted and the Likert scale was modified to a 6-pt Likert scale.

• Focus was changed from the organization level to the unit level.

• The Cronbach alpha are listed in table 2. This psychometric analysis provided preliminary evidence of the validity of this instrument for measuring nurses’ perception of work environment for this sample.

**Patient satisfaction survey**

• Patient satisfaction in the ICUs were measured by a survey constructed by Ingersoll (2004) and completed by patient s at their family member (if patient was unable to complete it). This is a 26 item instrument which rates satisfaction with nurse, physician, and facilities. Survey has been tested for internal consistency reliability with an alpha coefficient of .92 overall and .92 for the 12-item nurse subscale. This study only examined 12 of the 26 items related to patient satisfaction with nursing care.

**Data Analysis Method**

• ANOVA was used to make unit-level comparison of demographics for nurses.

• SPSS Windows was used for data analysis, with data from existing sources securely transferred into data filed for protection of source and subject right.

• Independent variables of this study included
  o Nurses’ perception of work environment (PES-NWI)
  o Unit-level covariant
    • RN skill mix
    • Rn hours per patient day
    • Voluntary turnover
  o Nursing demographic
  o Education

• Dependent variables was patient satisfaction

• Evaluation of the nurses’ perception of work environment was completed by examining data collected by the PES-NWI from 2005-2009.

• Patient satisfaction data were examined by data collected using the patient satisfaction survey in the same ICU units during the same study period (2005-2009). Descriptive statistics were used.

• Unit-level comparison were examined using chi-square, paired t-test and ANOVA.

• The final aim (Explore the relationship between nurses’ perception of work
- Perception of nurse manager leadership and ability was significantly related to patient satisfaction (p=0.018). Favorable perception of the nurse manager was associated with a .424 point increase in patient satisfaction.
- Final model had nonsignificant intercepts (means do not vary more than what would be expected by chance) and significantly different residuals (occurrence of unexplained (error) variance remained at the unit quarter level on patient satisfaction after adjusting for both level 1 and level 2 predictors)

**Discussion section**

- Patient population that was very satisfied with the nursing care
- Highest coring items was friendliness and courtesy of nursing staff
- This sample of nurses reported favorable perception of their work environment measured by PES-NWI-consistent with the literature, where nurses working in a magnet-designated hospital report being very satisfied with their work environment
- Significant differences were noted over the study period for the staffing and resources adequacy subscale and foundation of quality of care-mirror each other...if you don't have the staff or resources you can't provide the care.
- Nurses' perception of the role of their nurse manager was significantly related to patient satisfaction.
- An interesting finding for one unit (unit A) was patient satisfaction scores showed a steady decline over the study period along with nurses' perception of work environment also steadily declined over the study period for this unit. Further investigation into this unit revealed changes in management over the course of the study period.

<table>
<thead>
<tr>
<th>Implications</th>
<th>This study indicates that the nurses perception of their nurse manager has a relationship with patient satisfaction. Hospitals should ensure that nurses are satisfied with their nurse managers.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Strength/Weaknesses</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength</td>
<td></td>
</tr>
<tr>
<td>Weakness</td>
<td>The patient satisfaction was a new scale---unsure about reliability and validity.</td>
</tr>
</tbody>
</table>

**Limitations**

- Research design of a secondary data analysis is a limitation because the data were not collected originally to address the specific aims of the proposed study
- Each variable was measured at a different frequency, resulting in various numbers of observations.
- Secondary analysis does not allow for an increase in sample size, therefore sample size is a limitation of this study
- Nurse survey data had some of the same nurses completing the survey more than 1 year (test retest??)
- Patient satisfaction instrument has not been tested fully for psychometric characteristics and has been used in one setting only.
Literature Matrix 7

Foundation of Nursing Research

Carissa Williams
<table>
<thead>
<tr>
<th>Baccalaureate degree</th>
<th>21.2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master degree</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

**Patient Characteristics**

<table>
<thead>
<tr>
<th>Patient characteristic</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>54.3 (17.6)</td>
</tr>
<tr>
<td>Days of stay at time of survey</td>
<td>14.9 (18.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient characteristic</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>54.5%</td>
</tr>
<tr>
<td>Self rated health</td>
<td>19.6%</td>
</tr>
<tr>
<td>Excellent/ very good</td>
<td>33.2%</td>
</tr>
<tr>
<td>Good</td>
<td>47.2%</td>
</tr>
</tbody>
</table>

**Yr. Data Collected**

There is no date as to when the information was collected.

**Study Design**

The study design was quantitative cross-sectional design, with the use of questionnaires.

Purposeful sampling was used to obtain the sample of Level 2 (300-500 beds) and Level 3 (>500 beds). For each region there was an equal number of Level 2 and Level 3 beds. A total sample of 20 hospitals for each region was drawn, and sample hospitals that refused to participate were replaced by equal size and location hospitals. The refusal rate was approximately 4%.

Nurses were used as informants about the care in their hospital. Within each hospital, nurses were sampled from at least four inpatient units including medical, post-operative surgical, and intensive care. All bed side nurse, excluding nurse managers, from all shifts were invited to participate in the study. The goal was to obtain minimum of 50 nurses per hospital.

**Data Collection Method**

There was a research nurse designated by the nursing department by the hospital. The nurses the completed the survey returned it within 1 week, in a sealed envelope. No incentives were given.

The nurse survey instrument was the Multi-State Nursing Care and Patient Safety Study—this was translated from English to Mandarin and validated through back-translation and content validity testing (Sermeun et al., 2011).

The patient survey was adapted from AHRQ’s Consumer Assessment of Healthcare Providers and Systems (CAHPS) Hospital Survey—translation and validation of the CAHPS Hospital Survey included rigorous translation procedures and content validity testing with bilingual nurses and Chinese-speaking patients in one hospital.

- Deleted personal question to conform with Chinese norm
- Deleted discharge information since patients were still hospitalized
European data from RN4CAST was a study using the same research protocol and instruments and collected in the same time frame provided as a point of reference.

Provided descriptive information about nurses and patient. Then they showed descriptive information related to nurse outcomes and quality assessment and patient rating, and we compared these results with those from Europe.

Provide histograms which show the distribution of hospitals according to work environments and education composition of nursing.

Multi-level models to estimate how nursing work environments, patient-to-nurse ratios, nurse educational attainment, and nurse-assessed hospital safety grade are related to select outcomes after differences across hospital in the characteristics of nurses and patients are controlled.

- Controlled for nurse experience, unit type, hospital size, province, whether hospital was located in a capital city
- Patient outcomes controlled for length of stay, age, sex, health status, unit type, hospital size, province, whether hospital was located in the capital city.

Analyses were performed using STATA 11.

### Results

Demographic Data is listed above.
The following table (table 2 of paper) looked at the percent of Chinese and European nurses report various outcomes and quality assessments overall, and the range in those percentages across hospitals.

The following in the table just from this sample-China

<table>
<thead>
<tr>
<th>Nurse outcome</th>
<th>Percentage</th>
<th>Inter-hospital range</th>
</tr>
</thead>
<tbody>
<tr>
<td>High burnout (&gt;27 on emotional exhaustion)</td>
<td>38.1 +/- 1.00</td>
<td>8.3-73.3</td>
</tr>
<tr>
<td>Dissatisfied with current job</td>
<td>45.2 +/- 1.00</td>
<td>3.9-87.8</td>
</tr>
<tr>
<td>Dissatisfied with wages</td>
<td>75.6 +/- 0.86</td>
<td>33.3-100.0</td>
</tr>
<tr>
<td>Dissatisfied with nursing as a career</td>
<td>49.5 +/- 1.00</td>
<td>3.1-79.5</td>
</tr>
<tr>
<td>Nursing quality assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low grade on patient safety</td>
<td>36.3 +/- 0.98</td>
<td>5.8-76.1</td>
</tr>
<tr>
<td>Quality of care poor/fair</td>
<td>29.0 +/- 0.91</td>
<td>1.9-66.7</td>
</tr>
<tr>
<td>Describe the work environment as poor or fair</td>
<td>61.0 +/- 0.97</td>
<td>14.3-93.8</td>
</tr>
<tr>
<td>Not confident management</td>
<td>45.7 +/- 1.00</td>
<td>9.4-79.6</td>
</tr>
<tr>
<td>Implications</td>
<td>hospitals highly and nearly 30% more likely to be satisfied with nursing.</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------------------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>
| Strength/Weaknesses | Translated surveys—validated prior to use.  
Strength  
• No incentives  
Weakness  
• Cross sectional design-unable to determine causality  
• Sampling of hospitals was purposive, while the sample consisted of a diverse set of larger hospital in all geographic regions, it is not a probability sample (limitation) |
Literature Matrix 8
Foundation of Nursing Research
Carissa Williams
| **Data Collection Method** | Concentration of black patients  
- Percent of black patients in each hospital was calculated from the patient discharge data from the four states.  

**Nursing characteristics**  
- PES-NWI...has 5 subscales...one subscale was excluded from this study (staffing and resource adequacy) due to high correlation with the nurse staffing measure used in multivariate analysis.  

**Hospital characteristics**  
- AHA annual survey  

**Outcomes**  
- Nurses assessed quality of care came from four questions on the survey |
| **Data Analysis Method** | Concentration of blacks  
- Divided into three groups based on the distribution across study hospitals  
- Lowest group-less than 11% below the mean  
- Middle group-11%-23% between mean and one standard deviation above the mean  
- Highest group-23% more than one standard deviation above the mean  

**Nursing characteristics**  
- To classify hospitals based on their work environment...nurse response rate was aggregated into hospitals.  
- Intraclass correlation coefficient (reliability) ranged from 0.73 (nurse-physician relation) to 0.90 (participation in hospital affairs). Minimum was 0.60  
- Classified based on how many subscales were above the median-0, 1-3, 4 defined as poor, mixed and better respectively.  
- Nurse staffing-average nurse workload for the hospital...intraclass correlation coefficient was 0.78  

**Outcomes**  
- Intraclass correlation coefficient ranging from 0.50-0.61. Researcher state “Although these values are modest, past research has shown that nurse reports of the relative frequency of adverse event and patient conditions are accurate and reliable, including those of HAIs  
- HCAHPS- only used four measured the related most closely to nursing care-communication with nurses, responsiveness of staff, adequate discharge information and one global measure-willingness to recommend the hospital.  

Ordinary least square regression models were used to examine the association between the percentage of black patients in the hospital and two sets of outcomes-nurses-assessed quality of care and HCAHPS  

Four models were constructed for each outcome  
- Unadjusted models  
- Partially adjusted models controlling for nursing characteristics  
- Partially adjusted models controlling for hospital characteristics
<table>
<thead>
<tr>
<th>Implications</th>
<th>Strength/Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strength</td>
</tr>
<tr>
<td></td>
<td>• They used nurse surveys sent to individuals homes instead of hospital. This reduced response bias.</td>
</tr>
<tr>
<td></td>
<td>• Extremely large survey for nurses (98,000)-Approximately 26,000 nurses were used in this study. This increases external validity.</td>
</tr>
<tr>
<td></td>
<td>• Strengths to internal validity</td>
</tr>
<tr>
<td></td>
<td>• Only one survey-improve maturation</td>
</tr>
<tr>
<td></td>
<td>• Mortality-only one test</td>
</tr>
<tr>
<td></td>
<td>• Selection bias since they sampled a lot of nurses</td>
</tr>
<tr>
<td></td>
<td>• All subscales of the PES-NWI were reliable</td>
</tr>
<tr>
<td></td>
<td>Weakness</td>
</tr>
<tr>
<td></td>
<td>• The reliability coefficients were low 0.50-0.61 for nurse assess outcomes.</td>
</tr>
<tr>
<td></td>
<td>• They did a study with HCAHPS so you can’t link responses to units. This is general for the hospital.</td>
</tr>
<tr>
<td></td>
<td>• Small effect size is not uncommon when working with aggregated data such as the HCAHPS</td>
</tr>
<tr>
<td></td>
<td>• Cross sectional design-can’t link causality to relationship.</td>
</tr>
</tbody>
</table>
Literature Matrix 9

Foundation of Nursing Research

Carissa Williams
<table>
<thead>
<tr>
<th>Strength/Weaknesses</th>
<th>Strength:</th>
</tr>
</thead>
</table>

**Weakness:**
- Sample included hospitals of 100 beds or more in Illinois, the results cannot be generalized to smaller hospitals in a different state.
- Uneven number of hospitals in the Magnet and non-Magnet group which may limit ability to detect statistical differences.
- Cross-sectional design does not allow for causation.
Literature Matrix 10
Foundation of Nursing Research
Carissa Williams
<table>
<thead>
<tr>
<th>Data Analysis Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The authors matched the nursing data—the mean scores of the five subscales of the PES-NWI—to the patients' data on the basis of their wards (n=19) for final analysis.</td>
</tr>
<tr>
<td>• PES-NWI</td>
</tr>
<tr>
<td>o Average scores of the five subscales were calculated and used in this study</td>
</tr>
<tr>
<td>o Higher total scores indicated a higher degree of similarities to the work environment in magnet hospitals, implying a desirable practice environment.</td>
</tr>
<tr>
<td>• Patient satisfaction</td>
</tr>
<tr>
<td>o Summed five items were used for analysis as a patient satisfaction variable</td>
</tr>
<tr>
<td>o A higher total score indicates greater satisfaction among patients.</td>
</tr>
<tr>
<td>• The author identified basic attributes and characteristics of participants and organizations as well as items of patient satisfaction</td>
</tr>
<tr>
<td>• The author used descriptive statistics and calculated the Cronbach's alphas of the subscales of the PES-NWI of nurses and patient satisfaction</td>
</tr>
<tr>
<td>• The final analysis, if a hospital's work environment shows the characteristics of a magnet hospital, the characteristics of the work environment of each ward should be observed</td>
</tr>
<tr>
<td>o Researchers indicated that multilevel techniques need to be applied to the analysis of the data that represent patients embedded in units and units embedded in hospital.</td>
</tr>
<tr>
<td>o Thus, analysis using a multilevel modeling was preferable for final analysis in this study</td>
</tr>
<tr>
<td>• However, the data from the study (ex. a dataset consisting of 19 wards which contained 2-37 individual datasets, respectively) did not meet the requirements for analysis using multilevel modeling in terms of maintaining enough power.</td>
</tr>
<tr>
<td>• The distribution of patient satisfaction scores were not normally distributed coefficient of skewness, -0.848)</td>
</tr>
<tr>
<td>• Thus, to examine effects of the PES-NEI subscales on patient satisfaction, the author conducted multivariate logistic regression analysis for groups, which were dichotomized by 75 percentile of the scores of patient satisfaction</td>
</tr>
</tbody>
</table>
Literature Matrix 11

Foundation of Nursing Research

Carissa Williams
Data sources included:
- American Hospital Association (AHA) database
  - Teaching status, ownership, location, and bedside
- ANCC's Find a Magnet Hospital list
  - Magnet Status and year recognized
- Hospital Consumer Assessment of Healthcare Providers and Systems Survey (HCAHPS)
  - Patient satisfaction indicators

<table>
<thead>
<tr>
<th>Data Collection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent variable</td>
</tr>
<tr>
<td>- Magnet hospital status for the purpose of this study had three categories (Magnet, Magnet in progress, and non-magnet)</td>
</tr>
<tr>
<td>- Magnet-designated on or before 12/31/2007 (specific date was selected because the patient outcome data were collected on patient from July 1, 2008-June 30, 2011 (n=160)</td>
</tr>
<tr>
<td>- Magnet in process- hospitals undergoing steps to seek Magnet designation even though they had not actually earned the title (n=99)</td>
</tr>
<tr>
<td>- Not magnet (n=1,742)</td>
</tr>
<tr>
<td>Dependent variable</td>
</tr>
<tr>
<td>- Patient satisfaction=HCAHPS database</td>
</tr>
<tr>
<td>- Survey administered 2 days to 6 weeks after discharge</td>
</tr>
<tr>
<td>- Consist of 27 questions</td>
</tr>
<tr>
<td>- 10 sections...however, for this study they only looked at results from the 7 sections which are specific to nursing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Analysis Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPSS Window version 20</td>
</tr>
<tr>
<td>Multiple univariate analyses of variance (ANOVAs) to conduct a multivariate analysis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANOVA was run to determine significant differences existed in the percent of patients who addigned hospital the highest ranked rating on questions related to patient satisfaction with care.</td>
</tr>
<tr>
<td>P&lt; .007</td>
</tr>
<tr>
<td><strong>Determined there was a statistically significant difference between hospitals' magnet status for all of the outcome variables except for the Always received help when wanted (p=.009)</strong></td>
</tr>
<tr>
<td>Nurses always communicated well</td>
</tr>
<tr>
<td>- Statistically significant difference in the percent of patients' rating of always on the question regarding how well nurses communicated was identified between hospitals of different magnet status level</td>
</tr>
<tr>
<td>- Always received help when wanted</td>
</tr>
<tr>
<td>- There was no statistically significant difference in patients' rating of always on the question regarding whether help was received when needed</td>
</tr>
<tr>
<td>- Pain was always controlled</td>
</tr>
<tr>
<td>- There was a statistically significant difference in the percent of patients' rating of always on the question regarding how...</td>
</tr>
</tbody>
</table>