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Relationship between Patient Safety Culture and Safety Outcome Measures among Nurses

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Relationship between Patient Safety Culture and Safety Outcome Measures among
Nurses

by

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A thesis submitted to the faculty of
Gardner-Webb University Hunt School of Nursing
in partial fulfillment of the requirements for the
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Abstract

Preventable errors in healthcare are a significant problem in today's society, contributing

to numerous adverse patient outcomes and even deaths on a daily basis. Identifying

adverse outcomes is an imperative first step in creating a safer healthcare system, which

can be followed by cause analyses and action plans to address systematic issues and

improve process reliability. Despite the widespread use of voluntary reporting systems to

identify adverse events, recent literature has found extreme limitations and severe

underreporting with its use in healthcare facilities. A frequent theme in the literature

implies that identifying reportable events and discouraging hesitation in reporting begins

with a strong safety culture. However, limited evidence was found in current literature to

establish a clear link between various dimensions of safety culture with event reporting

and overall safety perceptions. The purpose of this MSN thesis was to investigate the

relationships between the Agency for Healthcare Research and Quality's (AHRQ) 10

safety culture dimensions and four outcome measures, as categorized in the Hospital

Survey on Patient Safety Culture (HSOPSC), among direct care nurses. The primary

methodology of this research involved secondary analysis of existing data in which

survey results from the AHRQ's HSOPSC were obtained from a large teaching hospital

in the southeastern United Sates. Statistical correlational analyses were calculated using

SPSS and Excel for a sample of 433 direct care nurses. All results were found to be

statistically significant, in which a medium effect was seen in the correlations between

overall dimensions of safety culture and patient safety grade ($r = .476$, $p < .001$), as well

as between safety culture dimensions and overall perception of safety ($r = .391$, $p < .001$).

A small effect was seen in the relationship between overall dimensions of safety culture

and frequency of event reporting ($r = .275$, $p < .001$). A negative, but minimal

relationship was found between dimensions of safety culture and number of events

reported $(r = -.042$, $p < .001)$. The results of this study are consistent with previous

themes throughout the literature, in which leadership and communication were found to

influence safety culture and frequency of event reporting. Due to the limitations of this

MSN thesis, such as estimated frequency of event reporting on a survey item as opposed

to an actual frequency, further research is needed to strengthen the relationships that were

observed.

Keywords: Patient safety culture; barriers to incident reporting; safety culture

dimensions; Hospital Survey on Patient Safety Culture; frequency of event reporting;

nurse perceptions of patient safety; Donabedian; Structure, Process, Outcome

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      With immense gratitude, I would like to acknowledge the support I have received from those that have played a role in helping me achieve my goals. For everything, I would like to thank my mom, for her loving support and encouragement and for teaching me the value of education at an early age. A sincere thank you goes to my husband, for the love and support to help make this dream a reality. My daughter, Zoe, cannot begin to comprehend the joy that she has brought to my life, even in the most difficult days of balancing work-life-school responsibilities.

      For helping me achieve my professional and educational goal of completing graduate school, I am thankful for my thesis advisor, Dr. Cindy Miller, for guidance with my thesis, patience with my progress, and understanding of my goals. Special thanks to Todd Krupa for assistance with data collection. In addition, I am particularly thankful for the assistance with data analysis provided by Dr. Sally Bulla. Finally, I want to thank all of my family and friends for the support and love and encouragement along the way. Without each and every one of you, I would not be where I am today.

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CHAPTER I

Introduction

According the American Nurses Association (2014), "nursing is the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the diagnosis and treatment of human response, and advocacy in the care of individuals, families, communities, and populations." Based on these expectations, nurses clearly have a responsibility of promoting patient safety in delivering quality nursing care. The culture of the nursing profession is built upon patient advocacy, in which nurses may promote continuous improvement of patient safety through adverse event identification and reporting followed by innovative systematic approaches toward enhancing the safety of health care systems. Understanding patient safety culture and its relationship with reporting practices and safety perceptions among nurses is one way to identify potential areas for improvement in patient safety. However, in the examination of this topic, it is important to recognize patient safety culture as "a complex phenomenon that is not clearly understood by hospital leaders, thus making it difficult to operationalize" (Sammer, Lykens, Singh, Mains, & Lackan, 2010, p. 156). The purpose of this MSN thesis was to examine the relationship between patient safety culture dimensions and outcome measures among nurses.

Problem Statement

To highlight the need for improved patient safety, a recent study concluded that approximately 210,000, or one-sixth, of United States (US) deaths each year are related to preventable adverse events in hospitals. However, this number is estimated to represent *only half* of the actual deaths due to errors, but could not be confirmed due to

incompleteness of medical records (James, 2013). Another study identified that adverse events occurred in one out of every three of hospital admissions, but estimated that true rates are likely higher (Classen et al., 2011).

Improving patient safety among nurses begins with identifying errors through reporting systems. However, severe limitations exist with current voluntary event reporting systems. A study to identify and measure adverse events found that adverse events occurred in one-third of hospital admissions, with only 1% detected by voluntary reporting systems (Classen et al., 2011). Despite the limitations of current voluntary reporting systems, this method of detecting adverse events continues to be commonly used in US health care facilities. Therefore, it is necessary to uncover factors that may be associated with rates of event reporting and safety perception among nurses, who make up the largest professional workforce in healthcare. This MSN thesis attempted to identify whether or not there is a link between patient safety culture with overall safety perception and event reporting practices among nurses, which may help guide nursing leaders in their efforts to improve patient safety.

Justification of the Research

Over the past couple of decades, quality improvement initiatives in health care have focused on identifying errors as well as developing a culture of safety. In November 1999, the Institute of Medicine (IOM) released the well-known report, To Err is Human: Building a Safer Health System, as "a call to action to make health care safer for patients" (Institute of Medicine, 2000, p. 5). According to the 1999 report, preventable medical errors in hospitals claimed the lives of an estimated 44,000 to 98,000 Americans each year. These "statistics" were put into a perspective that heightened

awareness of patient safety as a priority, in which the number of deaths due to medical errors was translated into the hypothetical equivalent of a jumbo jet crashing every day, with no survivors. Additionally, the report described the cost of preventable errors, not only as a monetary loss of $17 to $29 billion per year, but also in terms of loss of trust in the healthcare system, decreased patient and healthcare professional satisfaction, loss of morale among health professionals, and the price of physical and psychological discomfort related to increased hospital stays due to error. Lost work hours, school absenteeism among children, and decreased levels of health among the population were also cited as a cost to society. The report emphasized that, "to err is human, but errors can be prevented. Safety is a critical first step in improving quality of care" (Institute of Medicine, 2000, p. 5). To lay the foundation for future safety initiatives, this report recommended that a "critical component of a comprehensive strategy to improve patient safety is to create an environment that encourages organizations to identify errors, evaluate causes and take appropriate actions to improve performance in the future" (p. 8).

In 2004, the Agency for Healthcare Research and Quality (AHRQ) released the Hospital Survey on Patient Safety Culture as a tool to help hospitals assess their organization's culture of safety, based on the following rationale:

Patient safety is a critical component of health care quality. As health care organizations continually strive to improve, there is a growing recognition of the importance of establishing a culture of safety. Achieving a culture of safety requires an understanding of the values, beliefs, and norms about what is important in an organization and what attitudes and behaviors related to patient safety are expected and appropriate (Sorra & Nieva, 2004, p. 1).

Establishing a relationship between patient safety culture and event reporting practices and safety perception among nurses will allow insight into areas that should be a focused on by nursing leaders.

The National Association for Healthcare Quality (NAHQ), (2012) also recognizes the value of integrity in reporting as a way to detect and eliminate systemic root causes of problems that may compromise patient safety. Failure to report events and near misses allows underlying systemic problems to continue because these issues do not get addressed if they are not reported. Therefore, NAHQ (2012) has called upon healthcare organization leaders "to implement protective structures to assure accountability for integrity in quality and safety evaluation and comprehensive, transparent, accurate data collection, and reporting to internal and external oversight bodies" (2012, p. 4). Furthermore, "without a strong and just safety culture, frontline providers and management may fail to identify an event as reportable or may hesitate to report such an event" (NAHQ, 2012, p. 5). Understanding this relationship, between safety culture and event reporting practices, was a primary objective of this MSN thesis.

The purpose of this MSN thesis was to examine the topic of patient safety culture and outcome measures with an exclusive focus on the nursing profession. As the nation's largest health care profession that comprises the greatest proportion of hospital staff, nurses are the primary provider of direct patient care in hospital settings. Although nurses work in collaboration with interdisciplinary teams, nursing is an autonomous profession, which operates independent of medicine or other disciplines (American Association of Colleges of Nursing, 2011). Due to the nature of the profession, nursing encompasses a culture of its own, supporting the need for examination of patient safety

culture from a nursing perspective. Additionally, when exploring the complex topic of culture, focus on specific "professional cultures" may provide results that are more relevant to the field of interest. In this case, nursing leaders may gain deeper insight into their own professional culture, improving the ability to identify distinct strategies that could encourage intra- as well as inter-professional collaboration to promote patient safety.

Purpose

The purpose of this MSN Thesis was to examine the relationship between patient safety culture dimensions and safety outcome measures among nurses that have the primary responsibility of providing direct patient care. Using the HSOPSC (Sorra & Nieva, 2004), the 10 safety culture dimensions explored included: Supervisor/manager expectations and actions promoting safety; Organizational learning—continuous improvement; Teamwork within hospital units; Communication openness; Feedback and communication about error; Nonpunitive response to error; Staffing; Hospital management support for patient safety; Teamwork across hospital units; and Hospital handoffs and transitions. Safety outcome measures among nurses were also of interest in this research, and included: frequency of event reporting, overall perceptions of safety, patient safety grade, and number of events reported.

Thesis Question or Hypothesis

The following questions were used to examine the relationships between patient safety culture and safety outcome measures among care nurses:

- What is the relationship between safety culture dimensions and frequency of event reporting among nurses?

- What is the relationship between safety culture dimensions and overall perceptions of safety among nurses?

- What is the relationship between safety culture dimensions and patient safety grade among nurses?

- What is the relationship between safety culture dimensions and number of events reported among nurses?

Conceptual Framework

Donabedian's Quality Framework was used as a conceptual framework to guide this thesis. The interrelationships between three basic dimensions: structures, processes, and outcomes, are the focus of Donabedian's framework. The physical and organizational aspects of health care settings are considered the "structures." Structures provide resources for individuals to participate in patient care activities, which are necessary for the next concept, "processes" to occur. Processes are implemented to progress patient health "in terms of promoting recovery, functional restoration, survival, and even patient satisfaction" (McDonald et al, 2007, p. 113). Donabedian's framework illustrates that "outcomes" are the results of structures and processes. Quality systems were applied to Donabedian's framework in a study by Kunkel, Rosenqvist, and Westerling (2007), and strong indications of a relationship between structure, process, and outcomes were found. When describing quality systems, structures were described as resources and administration, processes were culture and professional cooperation, and outcomes as competence development and goal achievement. This MSN thesis focused on patient safety as a quality system to examine the relationship between nurse perceptions of patient safety culture with outcome measures of event reporting practices

and overall safety perception. Registered nurses comprise a large human resource of health care facility structures, and, for the purpose of this MSN thesis, nurses can be described as a "structure" of the hospital. However, the major focus of this thesis was to find a relationship between the "process" and "outcomes." The "process" of safety culture perception was measured in terms of safety culture dimensions according to the AHRQ's Hospital Survey on Patient Safety Culture. "Outcomes" of event reporting practices and overall safety perception were measured by using the AHRQ's survey outcome measures. Figure 1 represents a conceptual-theoretical-empirical diagram to identify the relationship between these concepts and how the concepts were measured.
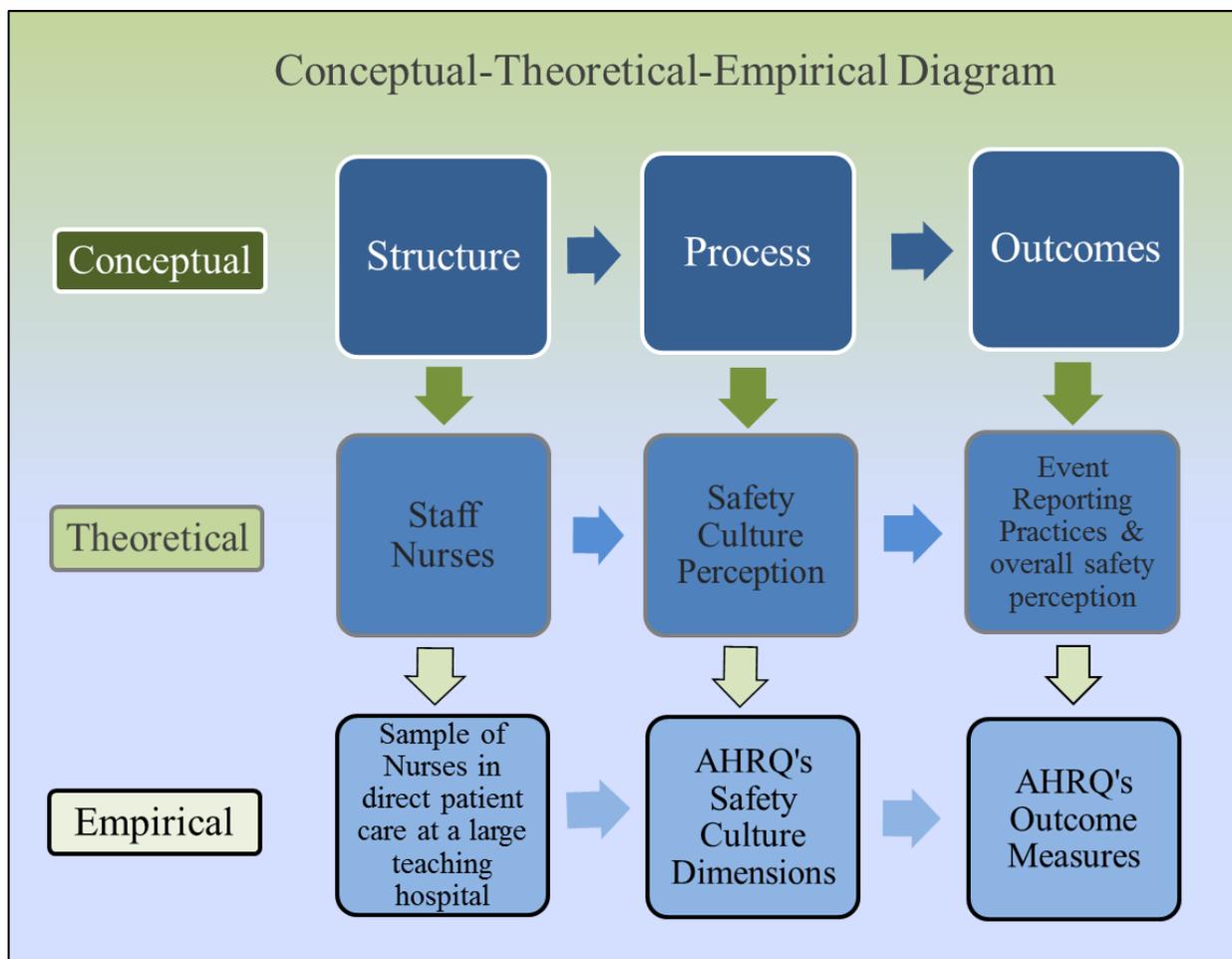
Figure 1. Conceptual-Theoretical-Empirical Diagram based on Donabedian's Structure-Process-Outcomes Framework.

Definition of Terms

"Safety culture" is a term used throughout this thesis, as well as a primary focus of this study. The following is a definition of safety culture as cited by Sorra and Nieva (2004):

The safety culture of an organization is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measures (p. 1).

"Safety culture dimensions", the independent variable in this research study, included eight unit level and two hospital-wide measurements of patient safety as outlined in the AHRQ's Hospital Survey on Patient Safety Culture. The unit level dimensions were: supervisor/manager expectations and actions promoting safety; organizational learning—continuous improvement; teamwork within hospital units; communication openness; feedback and communication about error; nonpunitive response to error; staffing; and hospital management support for patient safety. Hospital-wide dimensions included: teamwork across hospital units; and hospital handoffs and transitions (Sorra & Nieva, 2004).

The term "outcome measures" is used in this MSN thesis to refer to the dependent variable and includes: frequency of event reporting; overall perceptions of safety; patent safety grade; and number of events reported. These outcomes measurements were also defined by Sorra and Nieva (2004).

Summary

Since the publication of the IOM's report in 1999 with estimates of 44,000 to 98,000 preventable medical error related deaths annually, patient safety initiatives have been a key focus in health care. Despite continued efforts over more than a decade, estimates of deaths related to medical errors have increased greater than twofold, with recent approximations of 210,000 deaths per year (Classen et al. 2011). Although this estimated "increase" may be somewhat related to initiatives to improve the ability to identify errors, patient safety remains a major public health concern. Furthermore, "identification and measurement of adverse medical events is central to patient safety, forming a foundation for accountability, prioritizing problems to work on, generating ideas for safer care, and testing which interventions work" (Classen et al., 2011, p. 581). This MSN thesis made every effort to expand on the topic of patient safety culture and outcome measures among nurses, in which a thorough knowledge base was developed through an in-depth literature review, followed by the research process. Finally, it is important to note that the original report that stimulated a national response to improving patient safety, *To Err is Human*, emphasized the importance of various professional contributions to the patient safety solution, with the expectation that, "no single action represents a complete answer, nor can any single group or sector offer a complete fix to the problem. However, different groups can, and should, make significant contributions to the solution (Institute of Medicine, 2000, p. 6)."

CHAPTER II

Literature Review

Introduction

This chapter provides a comprehensive in-depth review of recent research related to patient safety culture. A review of the literature was performed using EBSCOhost, Academic OneFile, BioMed Central, and Google databases. Keywords and phrases used in the search for literature included: patient safety culture; barriers to incident reporting; safety culture dimensions; Hospital Survey on Patient Safety Culture; frequency of event reporting; nurse perceptions of patient safety; Donabedian; and Structure, Process, Outcome. The purpose of this review was to identify recent research related to patient safety culture and outcome measures and to identify any gaps in the literature surrounding this topic.

Major themes were explored related to patient safety culture dimensions and incident reporting among nurses including: perceptions of patient safety culture, assessment of safety culture, event reporting practices, and Donabedian's quality framework.

Perceptions of Patient Safety Culture

Patient safety culture characteristics among US hospitals were examined and organized to construct a conceptual culture of safety framework through a comprehensive literature review. Beliefs, attitudes, and behaviors surrounding safety culture in hospitals were identified throughout the qualitative meta-analysis to develop a framework and typology of safety culture. Of the seven patient safety subcultures, it was found that, "culture of safety begins with leadership" (Sammer et al., 2010, p. 157). Other patient

safety subcultures identified included: teamwork, evidence-based, communication, learning, just, and patient-centered. The study concluded that, due to the ambiguous and complex nature of "safety culture," it is challenging to operationalize. The key to organizational safety culture was found to be senior leadership accountability. Increasing regulations and consumer expectations in health care create pressures for hospital leaders to provide evidence of an organizational safety culture that ensures patient safety. According to the researchers, this study may improve hospital leaders' ability to answer the question, "what is a patient safety culture?" (Sammer et al., 2010, p. 156).

The link between structural empowerment and patient safety culture among adult critical care unit (ACCU) Registered Nurses (RNs) was examined in a study by Armellino, Quinn Griffin, and Fitzpatrick (2010). In this study, a background data sheet, the Conditions of Workplace Effectiveness and the Hospital Survey on Patient Safety Culture, were used to survey ACCU RNs in a United States tertiary hospital. A significant positive correlation was found, in which an increase in structural empowerment was linked with an increase in RN patient safety culture perception. Based on these findings, it is recommended that nurse leaders consider structurally empowered RN work environments to promote patient safety culture. Additionally, the researchers suggesedt that improved structural empowerment could provide an indirect influence on patient safety culture as a method to decrease and eliminate medical errors. This study had several limitations. The sample was relatively small and the response rate was fairly low in which, out of the 257 surveys, only 102 were returned (a 40% response rate). Also, the limited geographical and hospital setting, along with the inclusion of only one type of health care professional reduces the generalizability of this study. Although this

study provided an important link between structural empowerment and patient safety culture, its limitations suggested the need for further research.

Differences in the perception of patient safety culture among charge nurses and staff nurses were examined in a descriptive, correlational and cross-sectional study among registered nurses at a large Midwest academic medical center. The sample included 375 registered nurses, which represented 53% of the total nurses, who completed questionnaires over a three month period. Experience as a charge nurse, shifts worked in charge in the past month, and years worked as charge nurse on unit were measured as independent variables. The categorical variable of shift worked along with the demographic variables, education level and length of time in current unit, were also measured. Using four of the 11 subscales from the AHRQ's Hospital Survey on Patient Safety Culture, the dependent variables included: overall perception of safety, number of events reported, teamwork within units, and safety grade. More positive responses on overall safety perceptions and teamwork were found among non-charge nurses in comparison to charge nurses. Significant differences were found based on the number of years' experience among charge nurses, in which those with one to five or greater than five years of experience in charge were less positive in perceptions of teamwork within units, overall safety perception, safety grade for work area, and number of events reported. This study provided insight into perceptions of patient safety culture among charge and non-charge nurses and emphasized assessment of the charge nurse role as an important factor that, "may serve to improve the effective use of nurses as change champions" (Wilson, Redman, Talsma, & Aebersold, 2012, p. 6). Although this study was unique in that it highlights important differences among charge and non-charge

nurses, limitations existed. This study was conducted at a single site and used a

convenience sample; therefore, generalizability of the results may be limited.

Additionally, charge nurses in this study were not in designated positions, and

intermittently took on the charge nurse role, in which it was difficult for researchers to

determine true charge nurse experience.

The relationship between collective safety behaviors and patient safety culture

perceptions among registered nurses were examined in a cross-sectional study of 381

nurses from 11 medical-surgical units at a large academic medical center in Midwest,

Michigan (Wilson, 2012). Included in this study were the following confounding

variables that have been linked to patient safety culture perceptions: length of time in

current unit; highest level of education completed; shift worked; leadership experience;

nurse resilience; and work area.   The Safety Organizing Scale (SOS) was used to

measure safety organizing behavior at the unit level, which included measurement of five

sub-concepts: preoccupation with failure, sensitivity to operations, deference to expertise,

reluctance to simplify operations, and commitment to resilience. The AHRQ's scale was

used to measure perceptions of patient safety culture at the unit level, as well as patient

safety grade and number of events reported in the last 12 months. This study found a

relationship between increased safety organizing behaviors and positive nurse

perceptions about teamwork, manager actions promoting safety, organizational learning,

overall perceptions of patient safety, staffing, and safety grade for work area. Based on

the study findings, the researcher suggested that, "perceptions of patient safety culture

may be more accurate when assessed in conjunction with measurement of safety

organizing behaviors" (Wilson, 2012, p. 332). A major strength of this study included

the role of safety organizing behaviors in understanding patient safety culture, which makes it unique to existing research that focuses on hospital features and respondent characteristics. However, this study had limitations. The study setting was in a single hospital system with a convenience sample of nurses.   Additionally, safety organizing behavior was assessed through self-reports, which may have included bias.

Using the 12 sub-dimensions of patient safety culture as measured by the Hospital Survey on Patient Safety Culture, a cross-national research study was conducted to clarify the impact of long nurse working hours on patient safety culture in Japan, the US, and Chinese Taiwan. Evaluation of the impact of nurse working hours on patient safety culture outcome measures, patient safety grade and number of events reported, was based on odds ratios (ORs) which were calculated by a generalized linear mixed model. In Japan and the US, nurses working greater than or equal to 60 hours per week had a significantly lower OR for patient safety grade than nurses working less than 40 hours per week. In Japan, the US, and Chinese Taiwan, a significantly higher OR for number of events reported was found for nurses working greater than or equal to 40 hours per week. In all three countries, the average "staffing" score was significantly lower for nurses working greater than 60 hours per week than those in the less than 40 hours per week group. In Japan and Chinese Taiwan, the mean "teamwork within unit" score was significantly lower in the greater than or equal to 60 hour group than in the less than 40 hour group. The study concluded that long working hours were associated with deterioration of patient safety grade and an increased number of events reported. Additionally, in all three countries, long working hours impacted "staffing" and "teamwork within units" among the 12 sub-dimensions of patient safety culture. A major

strength of this study was that it was conducted across different countries, in which the researchers argued that common trends may be useful for improving patient safety culture in other countries. However, this study had some limitations. Objective indicators of 'staffing' such as patient acuity, or patient-nurse ratio were not collected; therefore, it was unclear how the actual work load or intensity impacted patient safety culture. Additionally, the response rate in the US was lower than Japan and Taiwan in which non-respondent characteristics are not known and the sample may not be representative of each entire country (Wu et al., 2013).

In another cross-national study, hospital patient safety culture across three countries, the Netherlands, the US, and Taiwan, was explored to discover similarities and differences using the Hospital Survey on Patient Safety Culture. This cross-sectional study gathered data from a large sample across broad geographical areas in which participants were: 3,779 professionals from 45 hospitals in the Netherlands; 196,462 professionals from 622 US hospitals; and 10,146 professionals from 74 Taiwan hospitals. Patient safety culture dimensions were the main outcome measures in this study. Two out of the 12 dimensions were similar across the three countries, with high scores on teamwork within units and low scores on handoffs and transitions. Significant differences between the three countries were found in the following patient safety culture dimensions: organizational learning—continuous improvement, management support for patient safety, communication openness, teamwork across units, and non-punitive response to error. Additionally, differences were found among frequency of event reporting with US respondent scores significantly more positive than the other two countries. Overall, US respondents were more positive on the majority of safety culture

dimensions along with their higher overall safety grade than respondents in the other two countries. However, responses between the country's hospitals in the Netherlands and Taiwan were more consistent than the US, which had more variation between hospitals. The large sample size across three countries provided a broad picture of patient safety culture from many different perspectives and is a major strength of this study. Additionally, this study provides insight into different cultural backgrounds using a tool that is assessing culture itself. On the other hand, several limitations existed including: the possibility of positive selection bias, variations in data collection methods between countries, differences in timeframes of survey administration, variation in sample size between countries, potential for country-specific effects to influence the survey instrument, and limited verification of data accuracy against alternate assessment results. Overall, the researchers conducted a robust study with the following valuable concluding implications based on the research findings:

Conducting comparisons on safety culture to identify opportunities for improvement is an important area for research with potentially useful implications for practice. The results have shown similarities and differences within and between the three countries. This means that within countries, hospitals with low scores on safety culture dimensions can learn from hospitals that have more developed safety cultures. Good examples can be found within each country, reducing the necessity to look over the borders when it comes to improving safety culture. However, for some dimensions with low scores nationally, countries can share best practices and learn from each other (Wagner, Smits, Sorra, & Huang, 2013, p. 219).

In China, healthcare workers' attitudes and perceptions of patient safety culture were explored using a modified version of the Hospital Survey on Patient Safety Culture (HSPSC), which measured 10 patient safety culture dimensions. Out of the 1500 questionnaires that were distributed to primarily internal physicians and nurses among 32 hospitals in China, valid responses were received from 1160 health care workers. Statistical analysis was done using SPSS 17.0 and Microsoft Excel 2007, including descriptive statistics, along with analysis of the survey's validity and reliability. Two separate investigators entered and verified data independently. For each item, results included a positive response rate range of 36% to 89%. On five dimensions (Teamwork within Units, Organization Learning-Continuous Improvement, Communication Openness, Non-punitive Response and Teamwork across Units), the positive response rate was higher when compared to AHRQ data ($p < 0.05$). Overall, a positive attitude towards patient safety culture within organizations was found among the surveyed health care workers in China. Based on their findings, the researchers emphasized, "the differences between China and the US in patient safety culture suggests that cultural uniqueness should be taken into consideration whenever safety culture measurement tools are applied in different culture settings" (Nie, Mao, Cui, He, Li, & Zhang, 2013, p. 228). Several strengths and limitations were noted. This study had a relatively high response rate of 77%. Additionally, this study is different from other published Chinese studies in that it was conducted among different cities in different hospitals in China, and surveyed different health care workers as opposed to those that focused only on nurses or assessment of the scale of the HSPSC. However, the survey was modified, with deletion of 13 original items, potentially changing the framework of the original patient safety

culture survey. Also, limited representation of hospital management in the sample may provide an incomplete picture of patient safety culture in China.

In a research study among 42 Taiwan hospitals, the HSOPSC questionnaire was used by Chen and Li (2010) to examine the 12 patient safety culture dimensions. A total of 788 physicians, nurses, and non-clinical staff completed the survey. Statistical analysis was done using SPSS 15.0 for Windows and Amos 7 software tools. Positive perceptions were found toward patient safety culture among Taiwan hospital staff, in which percentages of positive response rates were highest among "teamwork within units," and lowest in the "staffing" dimension. Taiwan and the US differed in the following three dimensions: "Feedback and communication about error", "Communication openness", and "Frequency of event reporting". Several strengths and weaknesses were identified in this study. When compared to the original AHRQ database, which included large samples in various health care organizations, this study's data had a lower internal consistency. The use of the HSOPSC questionnaire is both a strength and limitation in this study. Although the HSOPSC's strong psychometric properties and broad safety culture coverage were considered strengths, the use of this questionnaire in Taiwan is also a limitation of this study because of its use in a cultural setting different from where it was developed. However, it is important to note that the application of the HSOPSC in Taiwan was found to be a good fit according to most of the confirmatory factor analysis indices. Based on their findings, Chen and Li (2010) pointed out that, "the existence of discrepancies between the US data and the Taiwanese data suggest that cultural uniqueness should be taken into consideration whenever safety culture measurement tools are applied in different cultural settings" (p. 1). Not only is

future research recommended to expand the survey in Taiwan, but also to consider measurements that will decipher individual and group perceptions and interactions related to patient safety culture.

Assessment of Patient Safety Culture

Methodological aspects of safety culture assessment, along with their application in hospital studies on safety culture were identified and examined in a thematic review of the literature from 1999 through 2012. The literature review included searches from electronic databases, patient safety organization websites, and reference lists, with the inclusion of 43 records for analysis. Results showed that the literature related to hospital measures of patient safety in the specified time period surrounded three main methodological areas: research approaches; survey tools for data collection; and levels of data aggregation. Based on this study's analysis, future research was recommended to focus on clarification of core safety culture dimensions and identification of primary sources of safety culture variability. In addition, research using a mixed methods approach was suggested to allow for in-depth research to identify the multiple components of safety culture (Pumar-Méndez, Attree, & Wakefield, 2014). Although this study did not directly utilize a safety culture assessment, it provided a comprehensive review of literature and identified aspects and application of safety culture assessment, and offered a robust background to recommend future research.

Due to the importance of patient safety culture assessments, a review of the literature about the development of patient safety culture among nursing staff was conducted by Stavrianopoulos (2012). Scientific articles related to patient safety culture were searched in databases (PUBMED, SCOPUS) in March 2011 using the following

keywords in combination: patient, safety, culture, nursing, and staff. Patient safety was recognized as a priority concern in health care environments, and seven broad subcultures of safety culture properties were identified as: "leadership, teamwork, evidence-based care, communication, learning, just, patient-centered care" (p. 201). This study concluded the complex nature of patient safety culture and identified patient safety culture assessments as a key factor in obtaining a comprehensive perspective on various strengths and weaknesses of patient safety to determine areas that require attention. As with any method of research, this study had strengths and limitations. This review of literature combines ideas from current research and provided a unique insight into patient safety culture assessment. However, selection and interpretation of studies using this method of research are subject to researcher bias and must be considered as a limitation.

The multilevel psychometric properties of the AHRQ's Hospital Survey on Patient Safety Culture were examined in a research study by Sorra and Dyer (2010). This study analyzed survey data from 331 hospitals in the US, which included 2,267 hospital units and 50,513 respondents to examine survey item and composite psychometric properties. Included in the analysis was examination of: "item factor loadings, intraclass correlations (ICCs), design effects, internal consistency reliabilities, and multilevel confirmatory factor analyses (MCFA)… as well as intercorrelations among the survey's composites" (Sorra & Dyer, 2010, p. 1). Acceptable psychometric properties were found at all levels of analysis among the 12 dimensions and 42 items included in the AHRQ's survey with a small number of exceptions. One exception was found in the staffing composite, which fell slightly lower than cutoffs in several areas, however it is conceptually crucial due to its effect on patient safety. Another exception was found for

the dimension, Supervisor/Manager Expectations and Actions Promoting Patient Safety, in which one hospital-level model fit indicator was low. However, other psychometric properties related to this scale were considered good. Overall, the survey's items and dimensions are considered psychometrically sound among all levels of analysis: individual, unit, and hospital, and can be used to assess patient safety culture by researchers and hospitals. Both unit and hospital membership impact individuals' survey responses based on this study's multilevel psychometric results. Not only does the survey measure individual attitudes, but group culture at higher levels. Although this study provided an in-depth analysis of the psychometric properties of the survey, it does not identify relationships among patient safety culture and outcomes, which is an area that requires further research (Sorra & Dyer, 2010).

Due to the uneven distribution of positive and negative worded questions among the Hospital Survey on Patient Safety Culture's 12 dimensions, a research study was done to examine the survey for acquiescence bias. In this cross-sectional study, 300 nurses from two general teaching hospitals in Tehran, Iran were randomly assigned to either control or study group. Nurses in the control group received a short form of the survey, which was completely reverse worded in the questionnaire distributed to nurses in the study group. Data was analyzed through percent positive scores and t-tests using SPSS Version 16 for statistical analyses. Items with positive wording were found to have higher scores in comparison to their negative worded format among all dimensions in both groups. Included in the survey were 18 questions, which measured five safety culture dimensions. The only dimension with a statistically significant difference was, "organizational learning and continuous improvement," with a score that was 16.2%

lower in the study group. Additionally, six out of 18 differences in questions were found to be statistically significant. In all six, higher scores were found among questions with positive wording. Based on their findings, this study concluded that the well-known Hospital Survey on Patient Safety Culture involves a risk of acquiescence bias which may lead to exaggerated reports of patient safety culture dimensions. The researchers suggested, "Balancing the number of positive and negative worded items in each composite could mitigate the mentioned bias and provide a more valid estimation of different elements of patient safety culture" (Moghri et al., 2013, p. 1058). Although this study provided new insight into potential acquiescence bias related to the Hospital Survey on Patient Safety Culture, it has limitations. The sample size was adequate, but a larger sample could provide a better representation of the population. Also, the sample was somewhat narrow in its focus, in which all participants were nurses and the majority was female. Another limitation of this study was the individual differences among those completing the survey, which could be addressed by distributing both questionnaires to the same individual at different times. This method would provide stronger evidence of acquiescence bias (Moghri et al., 2013).

Event Reporting Practices among Nurses

Intensive Care Unit (ICU) Registered Nurses' perceptions of patient safety climate and potential predictors for patient safety perception and incident reporting were explored in a cross-sectional study by Ballangrud, Hedelin, and Hall-Lord (2012). In10 ICUs in six hospitals in Norway, 220 nurses (72%) responded to the questionnaire, The Hospital Survey on Patient Safety Culture. The questionnaire measured seven unit level and three hospital level patient safety climate dimensions, along with two outcome items.

Of the 12 dimensions, seven achieved a RN proportion of positive scores (over 55%), and five achieved a lower proportion. Among types of units and between hospitals, significant differences in RNs' perceptions of patient safety were found. Unit level variables were found to have had significant impact on the outcome dimensions "overall perception of safety" and "frequency of incident reporting", in which both had a 32% total variance. However, among the outcome variables, differences were found in positive scores on "overall perception of safety" (69%) and "frequency of incident reporting" (18%). In all dimensions, the total average of positive scores was 55%. This study concluded that patient safety climate was most positive among ICU RNs at the unit level, and areas for improvement included: "incident reporting, feedback and communication about errors, and organizational learning and continuous improvement" (p. 352). This study identified several limitations. In contrast to other Norwegian HSOPSC studies, which included various health care professionals, this study's sample only included RNs. Additionally, generalizability is limited since the hospitals in this study were small and within a limited area of Norway. Another limitation to this study that may have impacted the results was the known implementation of reorganization across units that were to occur after data collection.

Attitudes and perceived barriers to incident reporting among tertiary level health professionals were researched by Malik, Alam, Mir, and Abbas (2010) to address the limited incident reporting framework in Pakistan. A random sample of 217 doctors and nurses in Shifa International Hospitals were given a modified version of the AHRQ's questionnaire to determine various factors that influence health professionals' reporting behaviors, with an important focus of the study on barriers to incident reporting. Results

of the study found that only 20% of house officers were willing to report, and greater

than 95% of consultants, registrars, medical officers, and nurses were willing to report

incidents related to them. 'Administration sanction' was identified as a common barrier

among doctors (69%) and nurses (67%). Additionally, reporting to the head of the

department was preferred by doctors (60%) and nurses (80%). Based on the study's

findings, the researchers suggested that implementation of future incident reporting

systems should consider supportive work environments, prompt feedback, and immunity

from administration (Malik et al., 2010).

The relationship between nurses' work environment and patient safety outcomes

were examined in a cross-sectional quantitative study conducted within a European FP7

project: Nurse Forecasting: Human Resources Planning in Nursing (RN4CAST) project.

Survey data was obtained using the Practice Environment Scale of the Nursing Work

Index (PES-NWI) questionnaire from 1,397 nurses in direct patient care in 108 general

medical-surgical units in 30 hospitals all over Ireland. Ward and nurse level

environmental variables, along with outcomes of nurse-reported patient safety levels and

the number of nurse-submitted adverse event reports were analyzed in this study. The

results of this study were consistent with other research, in which a relationship existed

between positive nurse working environments and improved patient safety outcomes.

Safety outcomes were significantly impacted by unit level practice environment and

proportion of nurses with a degree at the ward level. Furthermore, this study found a link

between nurse work environment and rates of adverse event reporting, with positive work

environments resulting in increased event reporting among nurses. This study concluded

the importance of recognizing and manipulating nurse and environmental factors that

influence patient safety. Based on the study's findings, Kirwan, Matthews, and Scott (2012) suggested that, "cost effective enhancement of the work environment of wards, focusing on management, leadership and teamwork could result in safer patient care" (p. 262). Strengths of this study include the large sample size over a large geographical area along with the consistency of findings with previous literature. However, the study was conducted in Ireland, in which cultural differences exist, and this must be considered as a limitation in the generalizability of research findings (Kirwan et al., 2012).

Reasons for reporting wrongdoings among registered nurses within a public teaching hospital in the Midwest were examined in a study by King and Scudder (2013). Using a survey to address reasons a nurse would report a wrongdoing, reasons why a nurse would decide not to report a wrong doing, nursing decision judgments, and demographic information, the researchers obtained a sample of 241 registered nurses that agreed to participate in the study. Of the nurses that responded, 72 observed wrongdoings that warranted reporting within the year prior, but only 68 actually reported the wrongdoing. The 68 registered nurses that reported the incident were the focus of this study. Within their organization, incidents that were more likely to be reported were those that threatened patient well-being and professional ethics. Another factor that had a small, yet important effect on reporting incidents among nurses was observer anonymity. Additionally, the study found that nurses had a very strong tendency to overlook serious mistakes made by nurses perceived to be "competent" among their peers. Although this research provided insight into reasons that nurses report incidents, the number of participants was small and only included those who actually reported the wrongdoing. Other limitations to this study included that little is known about nurses that chose not to

participate, only one medical site was used to recruit nurses, and nurses were asked to select from a list of 10 items as reasons for reporting in which they were not able to add personal reasons for incident reporting. However, the researchers point out, "it is clear from this study that there are professionals out there who are more concerned about those they are serving than protecting their own interests" (King & Scudder, 2013, p. 634).

One research study compared the following three methods of detecting adverse events in hospitalized patients: "the hospital's voluntary reporting system, the Agency for Healthcare Research and Quality's Patient Safety Indicators and the Institute for Healthcare Improvement's Global Trigger Tool" (Classen et al., 2011, p. 582). This study involved a review of 795 total patient records from three large US teaching hospitals with well-established patient safety programs. Evaluation and comparison of the three methods to measure patient safety among the three hospitals was the focus of this study. Two of the methods of detecting adverse events, voluntary reporting and the Agency for Healthcare Research and Quality's Patient Safety Indicators, are frequently used to track patient safety in the United States. The third method, utilization of the Global Trigger Tool, includes a systematic chart review by two to three trained employees to detect any "triggers" in the chart. Any "triggers" found in the chart review were followed up with further investigation to determine whether an adverse event occurred, and if so, the severity of the event. Confirmation of the event required physician examination and sign off on the chart review. Using all three methods combined, adverse events were found to occur in one third of hospital admissions, in which 393 total adverse events were detected in the 795 patient records. The breakdown of detection rate according to the method used was: 354 adverse events detected using the

Global Trigger Tool, four events identified with the hospital reporting system, and 35 events discovered with the Patient Safety Indicators. In conclusion, the researchers described the current severe limitations of widely used voluntary reporting systems and the Patient Safety Indicators that may misdirect patient safety improvement efforts. Furthermore, the researchers recommended, "as policy makers struggle to measure improvements in patient safety, the results of our study should help inform ongoing efforts to evaluate methods for the detection of adverse events in hospital patients" (Classen et al., 2011, p. 586). This supported the need for this MSN thesis, to discover if patient safety culture affects the frequency of voluntary event reporting among nurses, and subsequently the detection of adverse events. It is important to note limitations and to point out the connection between the findings of the study and this MSN thesis. Because this study involved retrospective record review based solely on documentation and lacked real time direct observation, there is no way to assess the actual number of adverse events. Additionally, the characteristics of the hospitals in this study may not be representative of average hospitals in the US, in which all three were tertiary referral centers and had well-established patient safety programs. One of the methods to detect adverse events in this study was the hospital's voluntary reporting system, which is parallel to a focus of this MSN thesis, event reporting practices. Although the study by Classen et al. (2011) provided valuable insight about the relationship between reporting practices and adverse events, their research does not differentiate nursing from other professions, whereas this MSN thesis specifically examined nurses.

Donabedian Model: Structure, Process, Outcome

Kunkel et al. (2007) were the first known researchers to apply Donabedian's model to quality systems in a large quantitative study. Donabedian's "structure, process, and outcome" were used as a framework for the study's objectives: to develop a new model of quality systems; to investigate whether these components can be used to describe quality systems; to analyze the relationship between these components; and discuss implications. The new quality systems model describes structure as resources and administration, process as culture and professional co-operation, and outcome as competence development and goal achievement. A random sample of hospital departments in Sweden received questionnaires that were developed by the researchers. Although questionnaires were sent to 600 hospital departments, 82 were either shut down or connected with larger departments, in which a maximum of 518 responses were expected. With a total of 386 valid responses, the adjusted response rate was 75%. Confirmatory factor analysis and structural equation modeling in LISREL were used to analyze data. Results showed that structure, process, and outcome reasonably represented hospital department quality systems, in which the relationship between structure with process (0.72) and outcome (0.60) was found to be strong. Additionally, in the presence of structure, there was also a relationship between process and outcome (0.20). Based on the research findings, there were strong indications of a relationship between structure, process, and outcomes when examining and describing quality systems. "The model states, for instance, that the more time and money for working with quality improvement (structure), the more positive attitude towards such work (process), and the more regular evaluation of quality related goal accomplishment (outcome)"

(Kunkel et al., 2007, p. 2). In reference to reporting mistakes, the researchers also suggested that rewarding positive examples and avoiding punishment may enhance the process of culture and cooperation. This MSN thesis examined the "quality system" of patient safety culture, which is parallel to the concepts examined in the research by Kunkel et al. (2007). Specifically, a major focus of this MSN thesis was to evaluate the process of patient safety culture in relation to the outcomes of patient safety perception and event reporting practices among nurses. However, it is necessary to note the importance of structure as well.

In theory, the structure of quality systems affects process and outcome. Since this is a cross-sectional study it is important to be careful when discussing causal relationships. However, structure is strongly related to the other two aspects, which may suggest that it is more important (Kunkel et al., 2007, p. 6).

In addition to describing the study, it is necessary to point out the strengths and limitations. Although one of the strengths in this study was a high response rate (75%) and non-responders only represent 25%, non-responders must be considered as a limitation that may have created potential bias and/or affected the robustness of the model. Despite these potential limitations, statistical findings indicated stable results. Further research was recommended to investigate quality systems in relation to departmental processes and hospital organizational structures, as well as to evaluate quality goal achievement.

The Donabedian model of Structure, Process, and Outcome (SPO) was used in a study by Gardner, Gardner, and O'Connell (2013) to evaluate quality and safety of nurse practitioner service. In this study, a mixed-methods design was used in which data was

collected though stakeholder survey, in-depth interviews of patients and nurse practitioners and by review of health records on service processes. In-depth preparation of Structure and Process was found to be imperative for effective implementation of a service innovation. The addition of nurse practitioner service was accepted by the multidisciplinary team and perceived as safe, effective and satisfactory by clinician stakeholders and patients. Donabedian's framework was found to be a valuable and validated approach for evaluating service innovation safety and quality. In addition, the interdependence of the Structure, Process, and Outcome components of the Donabedian model were further validated in this study in which specific structure components were found to impact the quality of service processes. The researchers described that when establishing nursing service innovation, comprehension of Structure and Process requirements lays the foundation for safe, effective, and patient centered clinical care.

The Donabedian Quality of Care Conceptual Framework was used in a study among US nursing homes to determine barriers as well as health information technology (HIT)-related facilitators to incident reporting. The survey was developed after a comprehensive literature review along with focus groups with eight nursing home administrators using Donabedian's framework. The following categories were included in the survey:

(1) Nursing Home profile (e.g., ownership, part of a chain); (2) incident reporting frequency and type (e.g., average number of monthly reports, narrative or computerized report); (3) incidents reported within the facility and to the state department of health (e.g., falls, pressure ulcers); (4) barriers… and (5) presence

of HIT facilitators in incident reporting processes (e.g., how is technology used for incident reporting) (Wagner, Castle, & Handler, 2013, p. 113).

Methods to track, monitor, or maintain data related to adverse events included computerized nurse entry in approximately 15% of nursing homes and no computer technology in about 18% of nursing homes. "By-hand" data analysis was conducted by about one-third of nursing directors. Nursing homes that did not use HIT were less likely to be accredited and not part of a chain or corporation. Many barriers and limited HIT-related facilitators to support incident reporting were found in this study. "Fears of reporting" were found to be a significant barrier, in which two out of the top three barriers related to fear of reporting the incident. Based on these findings, the researchers suggested improvements in HIT approaches to facilitate adverse event reporting. Additionally, it is recommended that fears related to incident reporting be addressed and reduced to promote incident reporting among staff. This study included many strengths and limitations. Although responses were nationally representative of nursing homes, there was higher response rate from "better" nursing homes and a disproportionately high rate of responses from nursing homes in the Midwest. It is unknown whether or not there was overlap among nursing homes in the same chain or liability insurance company that may support certain software systems. Additionally, due to the nature of this study, a primary objective was to obtain a descriptive assessment and there was limited examination of outcomes, which is recommended for future research (Wagner et al., 2013).

Summary

In examining this topic related to patient safety culture, it was necessary to include literature from various geographical and cultural backgrounds to allow for a comprehensive perspective of the "culture" aspect. International studies that compared the US to different geographical locations provided a perspective that triggered the idea that there is potential for increased variability between US hospitals when compared to other parts of the world. Therefore, it may be necessary to use greater caution with generalizations of studies conducted across the US. However, it is equally important to recognize the limited generalizability of all research in different cultural and geographical locations, especially in the investigation of a "cultural" topic.

Throughout the literature, the concept of a strong safety culture has been insinuated as a way to improve the health professionals' ability to identify reportable events and discourage hesitation in reporting (NAHQ, 2012). However, limited literature was found that established a link between safety culture and event reporting practices and overall safety perception specific to the nursing profession. Based on the current literature reviewed, this MSN thesis was necessary due to the limited research related to the relationship between safety culture dimensions and outcome measures among nurses at a teaching hospital in the Southeast United States.

CHAPTER III

Methodology

The purpose of this study was to examine relationships between patient safety culture and outcome measures among nurses. This study's methodology was based on examination of the following research questions:

- What is the relationship between safety culture dimensions and frequency of event reporting among nurses?

- What is the relationship between safety culture dimensions and overall perceptions of safety among nurses?

- What is the relationship between safety culture dimensions and patient safety grade among nurses?

- What is the relationship between safety culture dimensions and number of events reported among nurses?

Implementation

This study involved secondary analysis of existing data. Permission to use survey data from the AHRQ's Hospital Survey on Patient Safety Culture was obtained from the IRB of a large academic medical center in the southeastern United States. Survey responses were organized to include data from Registered Nurses and to exclude data from all other positions. Data was analyzed to determine relationships between safety culture dimensions and outcome measures among registered nurses.

Setting

The survey data was obtained from faculty and staff at a large academic medical center in the southeastern United States.

Sample

De-identified existing survey data from the AHRQ's National Patient Safety Culture Survey that was collected by individuals at a large teaching hospital was used for secondary analysis in this research. The sample of employees was obtained through email notifications and surveys were completed online. Of the 13,000 employees asked to participate in the survey, approximately 2,774 were Registered Nurses. This study focused on data related to Registered Nurses only. Data from all other positions in the hospital was excluded.

Design

The study design involved IRB approval for use of existing data to analyze correlations between safety culture dimensions and outcome measures among nurses. Participants in the original data collection completed the AHRQ's Hospital Survey on Patient Safety Culture. The data was analyzed using SPSS and Excel to calculate correlations and determine strengths of relationships between safety culture dimensions and outcome measures, as defined by the AHRQ's survey. The "strength" of the relationship was identified as a small ($\pm$ .1), medium ($\pm$ .3), or large ($\pm$ .5) effect.

Protection of Human Subjects

This study involved secondary analysis of existing de-identified survey data that was collected by individuals at a large teaching hospital in the southeastern United States. The following is a description of how the primary survey was collected with respect to protection of human subjects. Faculty and staff were encouraged to participate in completing the survey, but participation was voluntary and not required. The survey was anonymous, in which individuals logged in with department identification numbers that

were used for group feedback, not individual identification. Departments with less than 10 participants were not used in group reports as a method to ensure privacy. Additionally, the survey was completed through an external website in which responses were not linked to individual participants. Subject identifiers were not available, as the data collected was from a de-identified data set.

The facility's Institutional Review Board (IRB) approved the use of their Hospital Survey on Patient Safety Culture data for this study. Furthermore, the facility's IRB approval was submitted to the University IRB and accepted as a research topic.

Instruments

This study used existing data to perform secondary analysis and examined relationships between safety culture dimensions and outcome measures among registered nurses at a large teaching hospital. The hospital collected survey data using the Agency for Healthcare Research and Quality's Hospital Survey on Patient Safety Culture.

Data Collection

This study used existing de-identified survey data from the AHRQ's National Patient Safety Culture Survey that was collected by individuals at a large teaching hospital. The sample of employees was obtained through email notifications and surveys were completed online. Using the data obtained from the AHRQ's National Patient Safety Culture Survey, this study focused on data related to Registered Nurses only. The Agency for Healthcare Research and Quality's Hospital Survey on Patient Safety Culture was used to collect data between January and February 2014.

Data Analysis

Results were analyzed initially using descriptive statistics. Comparison between groups was done using chi square tests for proportions, and t-tests or ANOVA procedures for continuous variables. Other inferential statistical analyses were conducted as appropriate.

Summary

The methods of data collection and analysis described in this chapter, including data collection and analysis provide a background to allow for adequate understanding of the results, as well as implications for nursing and future recommendations. The correlations between safety culture dimensions and outcome measures that were examined in this MSN thesis are reported and discussed in the next two chapters.

CHAPTER IV

Results

This chapter presents the results of this MSN Thesis with details of important

findings of factual data, including the actual data that was collected and a description of

statistical analyses used to reach results. Correlations between safety culture dimensions

and outcome measures were analyzed in this research. Each of the 10 dimensions of

safety culture, according to the AHRQ's Hospital Survey on Patient Safety Culture was

analyzed to determine relationships with the four outcome measures of event reporting

and safety perceptions (Sorra & Nieva, 2004). The 10 safety culture dimensions, which

were analyzed as independent variables, include eight at the unit level, and two hospital-

wide areas related to patient safety culture. Unit level dimensions that were analyzed

included: supervisor/manager expectations and actions promoting safety; organizational

learning—continuous improvement; teamwork within hospital units; communication

openness; feedback and communication about error; non-punitive response to error;

staffing; and hospital management support for patient safety. Teamwork across hospital

units and hospital handoffs and transitions were the two hospital wide dimensions. The

outcome variables of frequency of event reporting, overall perception of safety, patient

safety grade, and number of events reported, were divided into four research questions.

Among the survey, various questions were reverse worded, and results were calculated

based on positive responses. The results presented in this chapter reflect this

consideration of reverse worded questions for appropriate representation of each area.

Relationships were described according to significance and correlation strength, as

defined by Field (2009), in which a Pearson correlation coefficient of $\pm$ .1 represents a

small effect; ± .3 represents a medium effect; and ± .5 represents a large effect. Sample

characteristics, followed by survey results that were analyzed in this MSN thesis are

described in this chapter.

Sample Characteristics

Secondary analysis of existing data that was collected by a large teaching hospital

in February 2014 was used to obtain the sample for this research. The original AHRQ's

Hospital Survey on Patient Safety Culture was sent to all employees at the hospital and

completed online. Approximately 13,000 employees, including 2,774 that were

Registered Nurses, received the survey.   Survey responses of employees that identified

their staff position as a Registered Nurse totaled 485. Incomplete responses to the survey

item that identified staff position, as well as all other identified positions were excluded

in the data analysis. It is important to note that 47 employees that completed this survey

did not identify their staff position, and those responses were excluded from this research.

Direct care nurses were the focus of this research study, therefore the 50 out of 485

respondents that identified themselves as Registered Nurses that do not typically having

direct interaction with patients, along with the two incomplete responses regarding direct

patient care, were excluded from the data analysis. The final sample for data analysis in

this research included survey responses from 433 Registered Nurses that typically

provide direct patient care. Since the survey was anonymous, the reasons for incomplete

responses regarding staff position and typical patient interaction are unknown.

Due to the anonymous design of the survey, background variables were limited to

include characteristics of working environment. The majority of the sample included

Registered Nurses from Medicine units (31.4%), intensive care units (16.4%), and

Surgery units (15.9%). A large number of nurses in the sample reported that they worked

20 to 39 hours per week (57.5%) and 40 to 59 hours per week (38.6%). The remaining

nurses worked either less than 20 hours per week (2.1%) or greater than 60 hours per

week (1.9%). The demographics of primary work area and hours worked per week are

shown in Table 1.

Table 1

Sample Characteristics: Background Variables

Primary hospital work area	n	%
Many different units/No specific unit	2	0.5
Medicine (non-surgical)	136	31.4
Surgery	69	15.9
Obstetrics	0	0.0
Pediatrics	36	8.3
Emergency department	21	4.8
Intensive care unit (any type)	71	16.4
Psychiatry/mental health	5	1.2
Rehabilitation	2	0.5
Pharmacy	1	0.2
Laboratory	7	1.6
Radiology	11	2.5
Anesthesiology	37	8.5
Other	35	8.1
Total	433	100.0
Hours worked per week		
Less than 20 hours	9	2.1
20 to 39 hours	249	57.5
40 to 59 hours	167	38.6
60 to 79 hours	6	1.4
80 to 99 hours	2	0.5
Total	433	100

The sample includes nurses with various levels of work experience in their current hospital, unit, as well as nursing profession in which higher percentages were seen for one to five years and six to 10 years in each category. Table 2 provides sample characteristics according to work experience, including the length of time employed in the hospital, and on their unit, as well as years worked in the nursing profession.

Table 2

Sample Characteristics: Work Experience

Length of Time Worked	Current Hospital		Current Unit/Area		Nursing Profession	
	n	%	n	%	n	%
Less than 1 year	39	9.0	70	16.2	27	6.2
1 to 5 years	125	28.9	160	37.1	111	25.6
6 to 10 years	91	21.1	107	24.8	89	20.6
11 to 15 years	40	9.3	38	8.8	51	11.8
16 to 20 years	41	9.5	22	5.1	49	11.3
21 years or more	96	22.2	34	7.9	106	24.5
Total	432	100.0	431	100.0	433	100.0

Major Findings

Each of the four research questions in this MSN thesis examined relationships between safety culture dimensions and outcome measures using correlational statistics. The data was analyzed for each research question.

Research question 1. What is the relationship between safety culture dimensions and frequency of event reporting among nurses?

The relationships between safety culture dimensions and frequency of event reporting were analyzed using correlational statistics. Each of the 10 safety culture dimensions included either three or four survey questions related to the dimension. The three questions in the survey that assessed frequency of event reporting addressed how often mistakes are reported that: are caught and corrected before affecting the patient; have no potential harm to the patient; and could harm the patient, but does not. Using SPSS, Pearson correlation coefficients were found between the survey responses for each individual question related to the dimensions and survey responses for each of the questions related to frequency of event reporting. Among each of the safety culture dimensions, the correlation coefficients for individual dimension questions and frequency of event reporting questions were averaged to find an overall correlation coefficient for that dimension. All correlations for this research question were found to be positive.

Of all of the dimensions, feedback about communication and error had the strongest correlation with frequency of event reporting, $r = .363$, $p < .001$. In addition, supervisor/manager expectations and actions promoting safety, $r = .325$; communication openness, $r = .313$; and hospital management support for patient safety, $r = .307$ (all $p < .001$), had medium effects on frequency of event reporting.

An overall small effect was found among the following dimensions and frequency of event reporting: organizational learning—continuous improvement, $r = .296$; teamwork within hospital units, $r = .251$; non-punitive response to error, $r = .247$; teamwork across hospital units, $r = .220$; and hospital handoffs and transitions, $r = .248$, (all $p < .001$). The weakest correlation with frequency of event reporting was for the staffing dimension, $r = .181$, $p < .001$.

Among some dimensions, survey response correlations with specific frequency of event reporting responses resulted in inconsistencies. For example, for the dimension, Organizational Learning – Continuous Improvement, results showed a medium effect for survey responses related to evaluation of change effectiveness in patient safety improvements, $r = .331$, and for actively doing things to improve patient safety, $r = .310$, but only a small effect for responses to, "Mistakes have led to positive changes here," $r = .248$ (all $p < .001$). Overall, the average correlation coefficient between organizational learning – continuous improvement and frequency of event reporting for all responses, showed a small effect ($r = .296$, $p < .001$). Findings are presented in Table 3.

Table 3

Question Correlations: Organization Learning—Continuous Improvement and Frequency of Event Reporting

		Survey Questions: Frequency of Event Reporting			
		When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported? **	When a mistake is made, but has no potential to harm the patient, how often is this reported? **	When a mistake is made that could harm the patient, but does not, how often is this reported? **	Averages
Survey Questions: Dimension 2: Organizational Learning – Continuous Improvement	We are actively doing things to improve patient safety.*	$r = .292$	$r = .335$	$r = .304$	$r = .310$
	Mistakes have led to positive change here.*	$r = .247$	$r = .251$	$r = .246$	$r = .248$
	After we make changes to improve patient safety, we evaluate their effectiveness.*	$r = .330$	$r = .342$	$r = .320$	$r = .330$
		$r = .289$	$r = .309$	$r = .290$	$r = .296$

* Survey responses and analyses based on 5 point scale: Strongly Disagree, Disagree, Neither, Agree, Strongly Agree.
** Survey responses and analyses based on 5 point scale: Never, Rarely, Sometimes, Most of the time, Always.

Communication openness had a stronger correlation with frequency of event reporting for mistakes that could harm the patient, $r = .344$, than frequency of event reporting for mistakes that are made that are caught and corrected before affecting the patient, $r = .287$, and mistakes made that have no potential harm to the patient, $r = .308$ (all $p < .001$). Survey responses for the communication openness dimension item, "staff will freely speak up if they see something that may negatively affect patient care," had a medium effect on responses for frequency of event reporting, $r = .356$, while response correlations for, "Staff feel free to question the decisions of those with more authority," and "staff are afraid to ask questions when something does not seem right" (reverse worded), had an overall smaller effect, $r = .288$ and $r = .294$ respectively (all $p < .001$). Findings are presented in Table 4.

Table 4

Question Correlations: Communication Openness and Frequency of Event Reporting

		Survey Questions: Frequency of Event Reporting			
		When a mistake is made, but is <u>caught and corrected before affecting the patient</u>, how often is this reported? **	When a mistake is made, but has <u>no potential to harm the patient</u>, how often is this reported? **	When a mistake is <u>made that could harm the patient</u>, but does not, how often is this reported? **	Averages
<u>Survey Questions:</u> Dimension 4: Communication openness	Staff will freely speak up if they see something that may negatively affect patient care.*	r = .326	r = .353	r = .389	r = .356
	Staff feel free to question the decisions of those with more authority.*	r = .265	r = .289	r = .311	r = .283
	Staff are afraid to ask questions when something does not seem right. (reverse worded).*	r = .270***	r = .281***	r = .333***	r = .294
Averages		r = .287	r = .308	r = .344	r = .313

* Survey responses and analyses based on 5 point scale: Strongly Disagree, Disagree, Neither, Agree, Strongly Agree.
** Survey responses and analyses based on 5 point scale: Never, Rarely, Sometimes, Most of the time, Always.
*** Results shown reflect relative correlation, in which reverse wording of survey question has been taken into consideration. Actual results were negative.

Regarding the relationships between hospital management support for patient safety, and frequency of event reporting, there were differences in coefficients between individual survey questions in the same dimension. The item that measured "hospital management provides a work climate that promotes patient safety" had a smaller effect on frequency of event reporting, $r = .281$, than the other two items that measured perceptions related to actions of hospital management that show patient safety as a top priority, $r = .326$, as well as the item regarding hospital management interest in patient safety $r = .314$ (all $p < .001$). Findings are presented in Table 5.

Table 5

Question Correlations: Hospital Management Support for Patient Safety and Frequency of Event Reporting

		Survey Questions: Frequency of Event Reporting			
		When a mistake is made, but is <u>caught and corrected before affecting the patient</u>, how often is this reported? **	When a mistake is made, but has <u>no potential to harm the patient</u>, how often is this reported? **	When a mistake is made that <u>could harm the patient</u>, but does not, how often is this reported? **	Averages
Survey Questions: Dimension 8: Hospital Management Support for Patient Safety	Hospital management provides a work climate that promotes patient safety.*	*r* = .280	*r* = .282	*r* = .283	*r* =.281
	The actions of hospital management show that patient safety is a top priority.*	*r* = .326	*r* = .312	*r* = .342	*r* =.326
	Hospital management seems interested in patient safety only after an adverse event happens. (reverse worded)*	*r* = .317***	*r* = .304***	*r* = .321***	*r* =.314
Averages		*r* =.307	*r* =.299	*r* =.315	*r* =.307

* Survey responses and analyses based on 5 point scale: Strongly Disagree, Disagree, Neither, Agree, Strongly Agree.
** Survey responses and analyses based on 5 point scale: Never, Rarely, Sometimes, Most of the time, Always.
*** Results shown reflect relative correlation, in which reverse wording of survey question has been taken into consideration. Actual results were negative.

Overall, results between all dimensions and the outcome measure, frequency of event reporting, showed a significant, but small effect, $r = .275$, $p < .001$. However, unit level dimensions alone were found to have an overall stronger relationship with frequency of event reporting, $r = .285$, $p < .001$, than hospital-wide dimensions, $r = .234$, $p < .001$. Results for individual dimensions are shown in Table 6.

Table 6

Research Question 1 Results: Overall Correlations between Safety Culture Dimensions and Frequency of Event Reporting

	Frequency of Event Reporting	
	Average Pearson Correlation	n
Dimension 1: Supervisor/Manager Expectations & actions promoting safety	0.325	430
Dimension 2: Organizational Learning – Continuous improvement	0.296	427
Dimension 3: Teamwork within Hospital Units	0.251	427
Dimension 4: Communication openness	0.313	429
Dimension 5: Feedback and Communication about error	0.363	426
Dimension 6: Non-punitive response to error	0.247	425
Dimension 7: Staffing	0.181	428
Dimension 8: Hospital Management Support for Patient Safety	0.307	429
Dimension 9: Teamwork across hospital units	0.220	428
Dimension 10: Hospital Handoffs & Transitions	0.248	423
Overall Average Pearson's Correlation Coefficient	0.275	

Research question 2. What is the relationship between safety culture dimensions and overall perceptions of safety among nurses?

Correlational statistics were used to analyze data to find the relationships between safety culture dimensions and overall perceptions of safety among nurses. Correlations between survey items for each of the safety culture dimensions and items for overall perceptions of safety were calculated using SPSS. The four survey items for overall perceptions of safety were:

1. Patient safety is never sacrificed to get more work done.

2. Our procedures and systems are good at preventing errors from happening.

3. It is just by chance that more serious mistakes don't happen around here. (reverse worded)

4. We have patient safety problems in this unit. (reverse worded)

Of all of the dimensions, Hospital Handoffs & Transitions had the weakest correlation to overall perceptions of safety, with a small effect, $r = .283$, $p < .001$. All other dimensions were found to have a medium effect on safety perceptions. Table 7 illustrates individual dimension correlations with safety perceptions.

Overall relationships between dimensions and safety perceptions had stronger correlation at the unit level (Dimensions 1-8), $r = .410$, $p < .001$, than at the hospital level (Dimensions 9 and 10), $r = .312$, $p < .001$. Altogether, the safety culture dimension responses showed a medium effect on overall perceptions of safety, $r = .391$, $p < .001$.

Table 7

Research Question 2 Results: Overall Correlations between Safety Culture Dimensions and Perception of Safety

	Overall Perception of Safety	
	Average Pearson Correlation, *r*	*n*
Dimension 1: Supervisor/Manager Expectations & actions promoting safety	0.408	430
Dimension 2: Organizational Learning – Continuous improvement	0.451	427
Dimension 3: Teamwork within Hospital Units	0.396	427
Dimension 4: Communication openness	0.424	429
Dimension 5: Feedback and Communication about error	0.370	426
Dimension 6: Non-punitive response to error	0.367	425
Dimension 7: Staffing	0.387	428
Dimension 8: Hospital Management Support for Patient Safety	0.484	429
Dimension 9: Teamwork across hospital units	0.341	428
Dimension 10: Hospital Handoffs & Transitions	0.283	423
Overall Average Pearson's Correlation Coefficient	0.391	

Research question 3. What is the relationship between safety culture dimensions and patient safety grade among nurses?

The relationship between safety culture dimensions and patient safety grade was analyzed using correlational statistics with SPSS. To determine patient safety grade, the survey item requested for respondents to, "give your work area/unit in this hospital an overall grade on patient safety," in which ratings were excellent, very good, acceptable, poor, or failing. Pearson correlation coefficients were found for individual questions and patient safety grade and averaged for an overall coefficient for each dimension.

For each of the dimension's relationship with patient safety grade, all correlations were found to be positive in which, as the perceptions of safety culture were more positive, patient safety grade was higher. However, there was a wide range of correlation strengths for different dimensions. The dimension, organization learning—continuous improvement had the largest effect on patient safety grade, $r = .603$, $p < .001$. Other dimensions with a large effect on patient safety grade were hospital management support for patient safety, $r = .563$; communication openness, $r = .546$; supervisor/manager expectations and actions promoting safety, $r = .543$, and teamwork within hospital units, $r = .536$ (all $p < .001$). Medium effects were found for feedback and communication about error, $r = .495$; staffing, $r = .419$; non-punitive response to error, $r = .410$; and teamwork across hospital units, $r = .377$ (all $p < .001$). Hospital handoffs and transitions had a weaker correlation with patient safety grade than all other dimensions, in which the correlation resulted in a small effect, $r = .271$, $p < .001$). Table 8 provides each of the dimensions and their corresponding correlation coefficients.

Table 8

Research Question 3 Results: Overall Correlations between Safety Culture Dimensions and Patient Safety Grade

	Patient Safety Grade	
	Average Pearson Correlation	n
Dimension 1: Supervisor/Manager Expectations & actions promoting safety	0.543	430
Dimension 2: Organizational Learning – Continuous improvement	0.603	427
Dimension 3: Teamwork within Hospital Units	0.536	427
Dimension 4: Communication openness	0.546	429
Dimension 5: Feedback and Communication about error	0.495	426
Dimension 6: Non-punitive response to error	0.410	425
Dimension 7: Staffing	0.419	428
Dimension 8: Hospital Management Support for Patient Safety	0.563	429
Dimension 9: Teamwork across hospital units	0.377	428
Dimension 10: Hospital Handoffs & Transitions	0.271	423
Overall Average Pearson's Correlation Coefficient	0.476	

The majority of the individual questions for each dimension were relatively consistent in each area. The staffing dimension showed the greatest inconsistencies between survey items, ranging from small, $r = .240$, $p < .001$, to large, $r = .543$, $p < .001$, effects. Table 9 includes specific items and correlation coefficients related to the staffing dimension.

An overall medium effect was found among all safety culture dimensions and patient safety grade, $r = .476$, $p < .001$. However, a large effect was found between unit related dimensions and patient safety grade, ($r = .514$, $p < .001$), whereas only a medium effect was found for the hospital wide dimensions ($r = .324$, $p < .001$).

Table 9

Question Correlations: Staffing and Patient Safety Grade

		Survey Question: Patient Safety Grade
		Please give your work area/unit in this hospital an overall grade on patient safety.
Survey Questions: Dimension 7: Staffing	We have enough staff to handle the workload.*	$r = .543$
	Staff in this unit work longer hours than is best for patient care. (reverse worded)*	$r = .240$**
	We use more agency/temporary staff than is best for patient care. (reverse worded)*	$r = .395$**
	We work in "crisis mode," trying to do too much, too quickly. (reverse worded)*	$r = .507$**
	Average	$r = .421$**

* Survey responses and analyses based on 5 point scale: Strongly Disagree, Disagree, Neither, Agree, Strongly Agree.
** Results shown reflect relative correlation, in which reverse wording of survey question has been taken into consideration. Actual results were negative.

Research question 4. What is the relationship between safety culture dimensions and number of events reported among nurses?

Statistical analyses used to find the relationship between safety culture dimensions and numbers of events reported were correlational. Each of the dimensional items was correlated with survey responses for number of events reported in the past 12 months. The survey item for reported "number of events reported" had multiple response choices including: no events reported; 1 to 2 event reports; 3 to 5 event reports; 6 to 10 event reports; 11 to 20 event reports; and 21 event reports or more.

Although the effect was extremely small, correlations for the dimensions: Teamwork within Hospital Units and Feedback and Communication about error had positive correlations with number of events reported, $r = .026$, $p < .001$ and $r = .012$, $p < .001$, respectively. All other dimensions were found to have minimal negative correlations.

Minimal effect sizes were seen in individual as well as overall correlations for this research question. The overall correlation coefficient was $r = -.042$, in which the average unit level, $r = -.034$, as well as hospital-wide dimensions, $r = -.074$, had very minimal negative correlations with number of events reported (all $p < .001$). Results for each dimension can be found in Table 10.

Table 10

Research Question 4 Results: Overall Correlations between Safety Culture Dimensions and Number of Events Reported

	Number of Events Reported	
	Average Pearson Correlation	n
Dimension 1: Supervisor/Manager Expectations & actions promoting safety	-0.036	430
Dimension 2: Organizational Learning – Continuous improvement	-0.024	427
Dimension 3: Teamwork within Hospital Units	0.026	427
Dimension 4: Communication openness	-0.033	429
Dimension 5: Feedback and Communication about error	0.012	426
Dimension 6: Nonpunitive response to error	-0.058	425
Dimension 7: Staffing	-0.077	428
Dimension 8: Hospital Management Support for Patient Safety	-0.089	429
Dimension 9: Teamwork across hospital units	-0.071	428
Dimension 10: Hospital Handoffs & Transitions	-0.077	423
Overall Average Pearson's Correlation Coefficient	-0.042	

Summary

The large sample of 433 Registered Nurses contributed to the statistically significant results. However, the correlation strengths between dimensions and outcome measures varied among each of the research questions. Overall correlations between dimensions and frequency of event reporting, were found to have significant, but small effects, $r = .275$, $p < .001$. The relationship between all of the dimensions and overall perception of safety was found to be medium, $r = .391$, $p < .001$. Among all of the research questions, the strongest correlation was found between all of the dimensions and patient safety grade with a medium effect, $r = .476$, $p < .001$. Correlations between dimensions and number of events reported were almost nonexistent, $r = -.042$, $p < .001$.

CHAPTER V

Discussion

Introduction

The purpose of this MSN thesis was to examine relationships between patient safety culture dimensions, which were 10 major areas surrounding patient safety, and outcome measures that included frequency of event reporting, overall perceptions of safety, patient safety grade, and number of events reported, as provided by the HSOPSC. Direct care nurses at a large teaching hospital were the interest in this research, in which relevant survey responses were used for data analysis.

Implication of Findings

Current literature supported the use of the HSOPSC to examine various topics related to patient safety culture, in which Sorra and Dyer (2010) found the survey to be psychometrically sound among all levels. Previous research identifies leadership as an important component of patient safety culture among US hospitals (Sammer et al., 2010). In addition, frequency of event reporting has been found to be more positive in the US when compared to other countries (Wagner et al., 2013; Chen & Li, 2010). Other research has compared patient safety culture and perceptions among various roles as well as between different cultural environments. Although these research findings are significant and important to consider, they were not specific to nursing. Previous studies that examined the relationship between patient safety culture dimensions and outcome measures using HSOPSC specific to direct care Registered Nurses were not found throughout the literature search.

Although this research specifically examined patient safety culture related to nursing, it was consistent with general findings in previous research, in which leadership was found to be an important factor. Among four out of the 10 dimensions with the strongest relationship to frequency of event reporting in this thesis, two were related to leadership (supervisor expectations and actions promoting safety, and hospital management support for patient safety), with the remaining two related to communication (communication openness and feedback and communication about error), all with moderate correlations. However, the other six safety culture dimensions only had small correlations with frequency of event reporting, including non-punitive response to error, which could be categorized as both leadership and communication.

Regarding the dimensions related to overall perception of safety, including patient safety grade, understanding which dimensions are most closely linked with greater safety perceptions are important for leaders in developing safety initiatives. Overall perceptions of safety were found to be highest with more positive responses toward hospital management support for patient safety, and organizational learning—continuous improvement. All safety dimensions, except hospital handoffs and transitions which had only a small correlation, had medium correlations with overall perception of safety. Similar to overall perceptions of safety, the correlation was between hospital handoffs and transitions was also least linked to a positive safety grade when compared to all other dimensions. Interestingly, hospital handoffs and transitions only had a small relationship with overall perception of safety. Due to the significance in hospital handoffs and transitions in patient safety, it was surprising to find a weak relationship between this dimension and overall safety perception. Higher safety grades, as well as better overall

perceptions of safety, were most strongly correlated with the dimension, organizational learning.

Application to Theoretical/Conceptual Framework

Overall, the majority of findings in this research study were relatively consistent with Donabedian's framework of Structure, Processes, and Outcomes. The structures of the hospital, which included the nurses involved in direct care, were the subject of this research. The hospital processes that were evaluated according to patient safety culture, and the outcomes, were a result of the structures and processes in the majority of all dimensions, with the exception of the outcome measure, number of events reported. By examining the "processes" of the hospital, among the 10 safety culture dimensions, a relationship was not found between the outcomes, "number of events reported". There were relationships between the processes –measured by the safety culture dimensions— and the outcomes –measured by frequency of event reporting, patient safety grade, overall perception of safety, in which small to moderate correlations were found between the processes and outcomes. However, a minimal correlation was found between the processes and number of events reported.

Limitations

Although the sample size was large, and contributed to significance of findings, this study was limited to data obtained from a single organization in a specific region of the US. Therefore, the generalizability of these findings is limited. In any research with a focus related to "culture," generalizability is severely limited due to the nature of the topic in itself.

Because the "frequency of event reporting" was only a survey item, rather than an actual measure of event reporting, this measure is only based on the respondents' perception as an estimate of reporting. In addition to frequency of event reporting, number of events reported in the last year was a survey item, rather than a true measure. However, in contrast to frequency of event reporting findings, the correlations between the dimensions and number of events reported was minimal. These inconsistencies among frequency of event reporting and number of events reported create difficulty in interpreting the meaning of these results.

Implications for Nursing

Although further research is recommended to strengthen evidence of relationships found in this study, the results suggested that some components of safety culture may affect frequency of event reporting and overall safety perceptions among direct care nurses in the hospital setting. Due to limitations of this study, nursing implications must be inferred with caution. Until further research can strengthen the correlations of this thesis, only casual consideration of the results and implications could guide hospital leaders in evolving safety initiatives.

Relatively comparable results were found between each of the safety dimensions and their correlations to both outcome measures related to patient safety observations: patient safety grade, and overall safety perceptions. However, correlations between frequency of event reporting and number of events reported were dissimilar. Relationships found in this research may be a consideration in safety initiatives to meet nursing goals. For example, stronger correlations between organizational development and overall perceptions of safety suggested that improving nurse perceptions of patient

safety may incorporate organizational learning, while initiatives to improve event

reporting frequency may utilize communication techniques that focus on feedback and

openness, as these dimensions had a strong correlation with frequency of event reporting.

In addition, while attention to organizational learning and continuous improvement may

be an area of focus for hospital nurse leaders with goals toward improving safety morale,

this may not be the a primary focus for those with goals of increasing event reporting.

Organizational learning—continuous improvement, had the strongest correlation of all

dimensions in both outcome measures related to views on safety, patient safety grade and

overall perceptions of safety ($r = .603$, $p < .001$ and $r = .451$, $p < .001$, respectively).

However, among the other two outcome measures related to event reporting,

organizational learning correlations with frequency of event reporting resulted in a much

smaller effect ($r = .296$, $p < .001$), and there was almost no correlation with number of

events reported ($r = -0.024$, $p < .001$).

Based on the findings of stronger relationships between feedback and

communication about error, and communication openness with frequency of event

reporting, in combination with the weaker relationship for non-punitive response to error,

the type of communication may affect frequency of event reporting. Nursing leaders may

consider communication techniques in promoting event reporting in patient safety

initiatives, with focus on feedback about error and open communication. However,

further research to investigate the link between various communication techniques and

event reporting frequency among nurses is recommended. The weakest correlation for

frequency of event reporting was found for the staffing dimension.

Due to the insufficient strength of correlations between any of the dimensions and number of events reported, nursing implications regarding this outcome measure would require further investigation in future research.

Recommendations

Future research is recommended to examine safety culture relationships with actual event reporting occurrences and frequencies. Because this research only used a survey item to analyze event reporting, the frequency and number of events reported are only an estimate, rather than actual measure. A link between safety culture and actual event reporting would provide stronger evidence to support the relationships between the dimensions of safety culture and accurate outcome measures.

In addition, due to the nature of "culture" in itself, a qualitative study that examines safety culture and the relationship to safety perceptions and event reporting may provide a more in-depth understanding of the emotional and behavioral components.

Conclusion

The first step to creating a safer healthcare system is to report events, which will allow for follow up in reducing poor patient outcomes due to preventable errors. This MSN thesis focused on the nursing profession to identify a link between safety culture dimensions and safety outcome measures, including event reporting practices and overall safety perceptions to contribute to the literature regarding event reporting among nurses. Using the AHRQ's safety culture dimensions and outcome measures, statistical correlational analyses identified a link between various dimensions of safety culture and safety practices and perceptions. All results were found to be statistically significant, and results found an overall theme that linked leadership and communication in safety culture

to increased frequency of event reporting, which is relatively consistent with previous literature. However, due to limitations, further research is necessary to strengthen the relationships that were found, and to continue to make healthcare a safer place, focus on patient safety must be a priority.

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