The Relationship Between Perceptions of Patient Safety Culture, Nurse Advocacy, and Nurse Sensitive Patient Outcomes

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THE RELATIONSHIP BETWEEN PERCEPTIONS OF PATIENT SAFETY CULTURE, NURSE ADVOCACY, AND NURSE SENSITIVE PATIENT OUTCOMES

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By
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ABSTRACT

THE RELATIONSHIP BETWEEN PERCEPTIONS OF PATIENT SAFETY CULTURE, NURSE ADVOCACY, AND NURSE SENSITIVE PATIENT OUTCOMES

By

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May 2018

Dissertation supervised by Alison M. Colbert, PhD, RN, PHCNS-BC

The purpose of the study was to understand relationships between and among patient safety culture, nurse reported attitude toward patient advocacy and key patient outcomes. Nurses play an integral role in patient safety, providing care through constant interaction with the patient and clinical team. Advocating for patients is part of that role; however little research existed that explored how advocacy was related to the safety culture or specific patient outcomes.

A correlational cross-sectional design was chosen for this secondary data analysis. Correlation and regression models were applied to medical/surgical unit data from seven facilities within one hospital system. Sources of data included the patient safety culture survey from the Agency for Healthcare Research and Quality (AHRQ), the Nurses’ Attitudes Toward Patient Advocacy (APAS) Acting on Behalf of Patients (ABP) subscale, the Hospital Consumer
Assessment of Healthcare Providers and Systems (HCAHPS) survey, patient falls and hospital acquired pressure ulcers (HAPU).

Significant findings included a weak to moderate correlation between patient safety culture and attitude toward advocacy, and a moderate negative correlation between safety culture, advocacy and years of experience as a nurse. No significant correlations were found between safety culture and patient outcomes or advocacy and patient outcomes. Perceptions of experienced medical / surgical nurses within the participant hospitals were overall less positive about the patient safety culture and advocacy than their less experienced peers. These results raised questions as to whether adequate leadership attention was being given to the practice concerns of experienced medical/surgical nurses related to patient safety and advocacy.

Key Words: Patient safety culture, patient advocacy, patient outcomes, nurse demographics, nurse tenure
DEDICATION

To Gladys Husted PhD, RN, who was a gifted teacher, theorist and nurse.
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Chapter One

Introduction

Introduction

Historically hospitals have been considered safe places for acutely ill patients to receive care. In a landmark study Leape (1991) found that 3.7% of 30,195 randomly selected hospital records had evidence that an error had occurred in the care of the patient with an outcome of disabling injury or death. Of these mistakes two-thirds were preventable. Prior to this study there was a false sense of security that hospitals were safe therefore little attention was paid by clinicians or the public to the issue of patient safety.

When obvious mistakes were made the care provider would be disciplined and reeducated on the proper procedures for care delivery. At that time it was not recognized that human error was inevitable and that the only way to prevent error was to ensure that each critical process was structured with built in checks and double checks. Also the need to modify the care environment as an error prevention strategy was not recognized. The focus on caregiver error versus system or process error led to a culture in which a mistake was unlikely to be reported unless it could not be concealed. This type of culture led to a lack of data reflecting the overall safety of the health care environment because practitioners were not disclosing errors due to fear of retribution.

In the years following the Leape study, health care leaders turned to the airline industry to determine if the principles of human factors engineering could be applied in the health care setting to improve patient safety. The airline industry had improved their safety record by implementing blame free reporting of near miss and adverse events and then correcting the faulty systems that could lead to error. This process began in 1975 when the Federal Aviation
Administration implemented the confidential Air Safety Report System (Perrow, 1984). It was also during these years that the Institute for Healthcare Improvement (IHI) was founded and credited for raising awareness regarding the issue of patient safety and the need to import the concepts of blame free reporting and system improvement to health care (IHI.org, 2013).

Although some progress was made in the early years it was evident that the health care system was not implementing necessary change at the rate noted in the airline industry. Lucian Leape M.D. presented to the United States (US) Congressional subcommittee on the state of human error management in the US medical industry (Marx, 2001). The US Congress ordered a full study to be conducted by the Institute of Medicine (IOM) including recommendations for reducing medical error. The result was a publication, *To Err is Human*, which identified the need to develop a blame free culture in health care as the primary strategy to prevent adverse patient events (Kohn, Corrigan, & Donaldson, 2000).

This culture, which became known as the patient safety culture, was defined and preliminarily studied by disciplines other than nursing (Farley, Haviland, Champagne, Jain, Battles, Munier, & Loeb, 2008, Fogarty & McKeon, 2006; Khatri, Halbesleben, Petroski, & Meyer, 2007; Pronovost et al., 2003; Ramanujam & Rousseau, 2006; Tangirala & Ramanujam, 2008; Walters, 1992). These studies did not attempt to link patient safety culture to patient outcomes and therefore are not reflected in the review of the literature that follows.

The next step taken to create a mandate to improve patient safety culture was to conduct research that showed a relationship between patient safety culture and patient outcomes. Evidence now exists demonstrating a positive correlation between patient safety culture and patient outcomes as a result of these research efforts. This literature will be reviewed in chapter two. Although research supports the need for cultural change to improve patient safety and
patient outcomes, hospital administration has been slow to make sweeping cultural changes (Clancy, 2008). There are several reasons for the slow speed of cultural change in health care.

- Unlike the airline industry, health care employees are not directly impacted as a result of a medical error. The indirect impact can be significant but is often not considered until after the error has occurred. Airline pilots have the same risk of death as their passengers when an error occurs.

- Hospital systems are extremely complex making change difficult to consistently implement and enforce.

- Historically hospitals have been financially incentivized to increase the number of patients receiving care but not penalized when the care provided was of poor quality. This has changed over the last several years which could lead to resources being applied to improve the patient safety culture.

Nursing as a discipline ensures patients are safe as they receive healthcare. This responsibility can be challenging as multiple caregivers participate in the patients’ care but only one is present 24 hours a day. Nurses not only ensure that all disciplines are updated on the plan of care but also serve as the patients’ advocate to ensure safety (ANA, 2001). Nurses often struggle with their advocacy role due to culturally driven power gradients between care providers or the nurse’s own personal issues (Hanks, 2010). Little research has been conducted examining the relationships between patient safety culture, nurse advocacy and patient outcomes.

**Purpose of the Study**

The purpose of this study was to understand the relationship between and among patient safety culture, advocacy, nurse demographic characteristics and nurse sensitive patient outcomes. The study has added to the body of patient safety culture and nurse sensitive patient outcome
research while investigating if propensity for patient advocacy is connected to these already established relationships.

The researcher used a retrospective cross-sectional design with secondary data analysis. The level of analysis was both at the nurse and the nursing unit level. The dependent variables were advocacy and nurse sensitive patient safety indicators including pressure ulcers, patient falls and patient experience. The independent variables were the nurses’ perception of patient safety culture and demographic characteristics of the nurse.

**Research Questions**

It was the intent of the study to answer the following questions:

1. What is the relationship between the nurse’s perception of the patient safety culture and the nurse’s attitude toward patient advocacy?

2. What are the relationships among nurse demographic characteristics, patient safety culture and attitudes toward advocacy?

3. What are the relationships among nurses’ perceptions of patient safety culture, attitudes toward patient advocacy and nurse sensitive patient outcomes (patient experiences with nurses, falls, and hospital acquired pressure ulcers (HAPUs))?

**Definition of Terms**

**Patient Safety Culture.** Patient safety culture was defined as “management and staff values, beliefs, and norms about what is important in a health care organization, how organization members are expected to behave, what attitudes and actions are appropriate and inappropriate, and what processes and procedures are rewarded and punished with regards to patient safety” (Sorra & Dyer, 2010, p.199) as measured by the Agency for Healthcare
the nursing unit level.

**Patient advocacy.** Patient advocacy was defined as “a process or a strategy consisting of
a series of specific actions for preserving, representing, and/or safeguarding patients’ rights,
best interests, and values in the healthcare system” (Bu & Jezewski, 2007, p. 104) as measured
by the Attitude Toward Patient Advocacy Scale (APAS) Acting on Behalf of Patients (ABP)
subscale (Bu, 2005).

**Nurse sensitive patient outcomes.** The patient outcomes used in this study were
specific to those seen in the medical/surgical patient population including patient falls, and
hospital acquired pressure ulcers (HAPU) as captured by the Allegheny Health Network risk
management system, and three patient experience categories: communication with nurses,
responsiveness of hospital staff, and pain control as measured by the patient experience survey
conducted by Press Ganey.

**Medical / surgical Registered Nurse (RN):** An individual possessing a license to
practice as a Registered Nurse. This individual may be a graduate of an Associate Degree,
Diploma or Baccalaureate Degree program and is currently practicing as a nurse in the medical
/ surgical subspecialty of nursing.

**Assumptions**

This study was based on the following assumptions:

1. Acting as a patient advocate is an ethical and moral obligation of an RN that is
   articulated in the basic educational programs preparing RNs for practice and the ANA
code of ethics.

2. Data collection throughout the health system hospitals used in this study is uniform.
Limitations

The following limitations of this study have been identified:

1. The study was limited to RNs and therefore the results cannot be generalized to other healthcare providers.

2. The study was limited to RNs in one large healthcare system in Western Pennsylvania. The dynamics and culture of the community and the organization may differ from other hospital systems and therefore limit generalizability.

3. The lack of sample randomization will limit generalizability.

Significance to Nursing

The findings from this research may have significance for nursing theory, clinical practice, administrative practice and nursing education. Determining the relationship between organizational safety culture, propensity for advocacy and patient outcomes could assist to strengthen the understanding of the unique role of the nurse as a patient advocate in disciplines outside of nursing.

Significance for nursing theory. Most studies conducted related to patient safety culture have not utilized nursing theory as the conceptual framework. Nurses in their role as the 24 hours a day/7 days a week care providers have a unique role as the only care provider that is always with the patient, therefore providing the opportunity to advocate for patients’ safety.

Clancy (2008) notes that although it has been years since the IOM report, healthcare agencies are far from providing consistently safe environments for patients. Viewing these concepts through the lens of a nursing ethics theory may provide insight as to why cultural change has been slow and what might be done to expedite change.
**Significance for nursing practice.** Nursing practice is often dependent on the culture of healthcare organizations (Husted, 2008). Primary education programs prepare new nurses for the role of patient advocate to ensure the safety of the patient. As new graduates enter into practice in hospitals they find themselves immersed in a complex culture that may or may not prioritize the nurse—patient relationship as the primary relationship held by a nurse. Instead, relationships with non-nursing colleagues, leaders and peers may be culturally dominate at the expense of the nurse—patient relationship.

This research sought to articulate the relationship between advocacy and safety to provide a foundation for further interventional research to improve patient safety through strengthening the healthcare team’s understanding of the role of the nurse as a patient advocate. In the hospital setting the depth of the profession of nursing is at times misunderstood as an extension of the medical profession. It is important for all members of the team to understand the unique role that each brings to the care of the patient to ensure a safe environment.

**Significance to nursing administration.** Nurse administrators have the ability to impact the patient safety culture to a greater extent than nurses practicing at the bedside. One of the primary roles of the nurse administrator is to ensure that nurses are able to enact their advocacy role. Most administrators and other multidisciplinary team members are not educated in the nursing discipline, therefore a lack of understanding of the body of knowledge possessed by nurses is understandable. The nurse administrator is responsible to ensure that this knowledge is translated into a set of independent actions that promote patient safety, such as ensuring that patient’s wishes are known and preventing adverse events.

The results of this study could be used by nurse administrators to educate their non-nursing colleagues regarding the connection between patient safety culture and advocacy and to
justify needed cultural change. If a positive correlation is found between patient advocacy and safety culture, intervention studies designed to foster the nurse’s role in patient advocacy could strengthen the patient safety culture and improve nurse sensitive patient outcomes.

**Significance for education.** Those nurses who serve in the realm of academia instill patient advocacy as a primary role of the nurse. Patient safety culture is also instilled by nurse educators who orient new staff to the hospital setting. Solid ground work is laid however the practice environment is tremendously complex and often intimidating for new and even experienced nurses. New graduates have every intention of entering into the practice environment as a patient advocate, however the culture of the organization may not be supportive of advocacy.

The findings from this research provide additional evidence as to why the advocacy role is of key importance particularly in the promotion of patient safety. Significant results warrant additional research using educational interventions to improve the advocacy efforts of nurses while enabling them to simultaneously have strong relationships with their non-nursing colleagues.
Chapter Two

Review of Literature

Introduction

The purpose of this study was to determine the relationship between and among patient safety culture, advocacy, nurse demographic characteristics and nurse sensitive patient outcomes. Nurses practicing in hospitals are the 24 hour a day, 7 days a week presence for their patients. A nurse is present in most patient care interactions of a hospitalized patient whether that is in procedural areas or on nursing units. The culture that exists in each hospital is the context in which patient care is provided. The relationship between nurses and their colleagues, as well as the formal and informal policies set by the organization’s leaders, will determine the nurse’s practice environment. It is this environment that serves as the context for the nurse / patient relationship. Patient advocacy is one of the primary functions of the nurse within the nurse patient relationship.

The conceptual framework for this study is Symphonology, a bioethical decision-making theory that provides a philosophical approach connecting environmental factors to the relationship between nurses and their patients (Husted & Husted, 2008). This theory explains the importance of context when seeking to understand the nurse-patient relationship. It is important to view these concepts from the lens of a theory that is situated in healthcare and specifically nursing because the nurse is uniquely positioned to impact patient outcomes through the use of advocacy. A nurse may or may not choose to advocate for proper hand washing, a well performed time-out, adequate pain control and a quiet environment. The factors influencing advocacy decisions are often cultural and at times personal to the nurse
(Hanks, 2010). The nurse’s willingness to step up and advocate is of primary concern to nursing and hospital administrators because it is the role of these individuals to ensure that nurses practice in an environment in which patient safety is a moral obligation of those providing care (Affonso et al., 2003).

A thorough review of the literature is presented as it relates to several key concepts in this research: patient safety culture, patient advocacy and the relationship between each of these concepts and measurable nurse sensitive patient outcomes. Gaps in the existing research are identified which lends support for the proposed research study.

The review of the literature serves to answer the following questions:

- Does an organization with a more positive patient safety culture have improved nurse sensitive patient outcomes?
- Does the nurse’s attitude toward patient advocacy improve patient outcomes?
- Is there a relationship between patient safety culture and the nurse’s attitude toward patient advocacy?
- What are the gaps in the current research and what contribution does this study make to narrow one of the gaps in the available research?

Conceptual Framework

The conceptual framework for this research is based on Symphonology, a bioethics theory developed by Husted & Husted (2008). The premise of this researcher is that a nurse’s decision to advocate is an ethical decision. This is a valid premise as the American Nursing Association (2001) outlines advocacy within the nursing code of ethics. Also, prior research has validated advocacy as an ethical construct that is situated within the nurse-patient
relationship (Chafey et al., 1998; Beagan & Ells, 2007; Vaartio et al., 2006; Vaartio et al.,
2008; Vaartio et al., 2009). This theory, the origins of the relevant concepts, and the
applicability to this research study are reviewed.

**Development of the theory Symphonology.** Symphonology is the study of agreement
between health care providers and their patients. The theory was developed by James and
Gladys Husted using synthesis as a theory development strategy as defined by Walker and
Avant (1995). The name Symphonology comes from the Greek word for agreement,
symphonia (Husted & Husted, 2008). The theory was developed based on the observation of
practicing nurses making ethical decisions.

Husted and Husted utilized the philosophical works of Aristotle, Spinoza, and Polanyi to
formulate the concepts of Symphonology (Scotto, 2010). Existential phenomenology is central
to the construction of the theory due to the need to consider the context of each situation before
proceeding and the recognition that ethical decisions are made within the context of the current
patient situation.

Through personal experience and observations, Husted and Husted (2008) determined
that the core of the ethics process hinged on the formation of agreements. Although the theory
began with the study of nurses it was broadened to include other health care professionals.
Husted and Husted (1995) derived six bioethical standards that were important to consider in
ethical decision-making processes: autonomy, freedom, self-assertion, objectivity, beneficence
and fidelity. Agreement and the use of the standards occur within the context of the situation.
The overall context is a compilation of context of knowledge, context of the situation, and
context of awareness (figure 1). As each concept was induced, a resultant deductive process
was applied to evaluate the adequacy of the concept and to rigorously examine its relevance.
Philosophical underpinning of agreement in Symphonology. When reviewing the primary concepts of Symphonology, it is important to start with the concept of agreement. Husted and Husted (2008) define agreement as “A propensity or formal potentiality in entities to behave in specific ways and no others when they are interacting (p.311).” Agreement is the cornerstone of bioethics because without agreement it would be impossible for nurses to work with patients.

*Figure 1. Husted Decision Making Model. (Husted & Husted, 2008, p.77)*
Agreement as articulated in Symphonology is derived from the work of Spinoza, a 17th century philosopher, who studied the nature of human beings and their transition from rudimentary to advanced levels of knowledge in ethics (Deleuze, 1988). His work was grounded in the rationalist perspective and was formed in the times when philosophers were religion based. Therefore, his work is based on knowledge acquisition to become closer to understanding the knowledge that God possesses. He describes this journey in the Ethics, a book examining man’s development of knowledge and how that knowledge is utilized (Lloyd, 1996). Although the Ethics is not a document that describes right and wrong in modern day ethical terms, it does discuss man’s motivation to acquire what he perceives as good and to avoid what is bad which then provides the basis for ethical behavior.

Husted and Husted’s treatment of agreement was derived from Spinoza’s idea of common notions, which are general ideas that are common to all (Lloyd, 1996). This use of common notions established the basis for agreement between two individuals. Common notions are adequate ideas which, when understood by two persons, can be the basis for agreement. Dissatisfaction occurs when agreement is not achieved but is desired by the parties. Spinoza demonstrates that man is not born rational but becomes rational over time through a series of positive encounters that lead to agreement with those individuals in their lives. In essence, this acquisition of knowledge is gained experientially.

**Philosophical underpinning of context in Symphonology.** Context is defined as, “The interweaving of the relevant facts of a situation – the facts that are necessary to act upon to bring about a desired result, the knowledge one has of how to most effectively deal with these facts, and one’s awareness of what is relevant” (Husted & Husted, 2008, p. 313.). In order to fully understand the use of context in Symphonology it is also essential to understand the treatment of
knowledge acquisition and specifically intuition. The work of Aristotle, Spinoza, and Polanyi was drawn upon to formulate the concept of context in Symphonology.

Symphonology is considered a modern theory of ethics however it is important to recognize the Husteds’ use of the works of the Greek Aristotle (384-322 BC), the Dutch Spinoza (1633-1677), and the 20th century philosopher Polanyi in the development of the theory. All of these philosophers studied and wrote of the origins of intuition.

Aristotle, an early Greek philosopher, first articulated the concept of intuition in terms more scientific than a “knack or hunch” (McKeon, 1941). Philosophers prior to Aristotle, such as Socrates and Plato, had proposed that the highest level of knowledge is realized when viewed in the abstract and universal sense. Intuitive expertise at that time was ruled out because it did not seem to be based on any principles at all. Aristotle challenged this thinking and postulated that although universal principles based on a theory were necessary, they needed to be complemented with intuitive skill. Intuitive skill in this sense is learned. Intuition allows the practitioner to see how the principles could be applied to each individual case, therefore enabling the practitioner to practice in the context of the patient. Aristotle felt that this combination was essential in those professions such as medicine where the practitioner treats individuals.

Spinoza describes three types of knowledge (Lloyd, 1996). The first level of knowledge is not based on rational thought but on hearsay or general opinions and therefore tends to be the base of inadequate ideas. The second type involves rational thought and is based on reason, which forms the basis for the common notions or ideas that are common to all. This level, although advanced from the first, relies on generalizations and does not give us an idea of a singular essence or an individual’s situation or in another word -- context. The third type of knowledge is the highest level of achievement and moves beyond the general to a specific
understanding of an individual essence. This level of knowledge involves a concept of intuition. Spinoza argues that intuition is rational thinking with the use of imagination to bring the essence of the situation to light. The person who achieves the third level of knowledge is able to utilize imagination to originate ideas but then relies on reason to actually prove the ideas are true.

Polanyi (1962), a philosopher in the 1900s, was interested in the development of knowledge and, specifically, scientific knowledge. His conceptualization of the term “tacit knowledge” and its implication was revolutionary in the natural sciences. This deviation from rationalism was seen in the social sciences but not well adopted prior to Polanyi in the natural sciences. He demonstrated that knowledge acquisition involves a component of personal or tacit knowledge that is generally related to a specific context.

According to Polanyi, when highly skilled scientists consider a problem, they start with intuition and an inarticulate premise. The more scientists consider the problem and test their intuitions, the more clues are found until a full discovery results and scientific advancement occurs. The experienced nurse, like the experienced researcher, also uses tacit knowledge or intuition to understand bioethical decision-making in the context within which a patient sees the situation. In essence, Symphonology demands a complete understanding of the situation from the participant’s perspective. The context is necessary to utilize intuition.

**Philosophical underpinning of bioethical standards.** The bioethical standards are also extremely important concepts to consider in the understanding and utilization of Symphonology. The purpose of these standards in ethics is to guide and evaluate ethical action. In Symphonology, the standards are presupposed by virtue of the fact that there is an agreement. It is not the standards as rights but as preconditions of any agreement. Rights themselves are an
agreement made possible by the character-structures of rational beings. Based on these rights, six standards in Symphonology are identified and defined:

- “Autonomy refers to the uniqueness of an individual person” (Husted & Husted, 2008, p.57).
- “Freedom is self-directedness—an agent’s capacity and consequent right to take long-term actions based on the agent’s own values and motivations” (Husted & Husted, 2008, p.61).
- “Objectivity is a nurse’s or patient’s ability to achieve and sustain the exercise of his objective awareness” (Husted & Husted, 2008, p.65).
- “Self-assertion is the power and right of an agent to control his time and effort” (Husted & Husted, 2008, p.66).
- “Beneficence is the power of an agent and the necessity he faces, to act to acquire the benefits he desires and the needs his life requires” (Husted & Husted, 2008, p.70).
- “Fidelity is an individual’s faithfulness to his autonomy. For a nurse, fidelity is commitment to the obligation she has accepted in her professional role” (Husted & Husted, 2008, p.72).

**Attitude toward patient advocacy situated within the patient safety culture.** The nurse’s conscious or sub-conscious decision to act on behalf of the patient can be influenced by the culture of the organization. Nurses must balance the need to take action that is in the best interest of the patient while considering guidance from peers, members of the medical staff or leadership. The provision of patient care does not occur in a vacuum therefore the context of the
nurse-patient interaction must be considered (Sellin, 1995; Snelgrove & Hughes, 2000). Nurses graduate from nursing programs with an understanding of the nursing code of ethics (ANA, 2001) and in particular the need to advocate for vulnerable patients. However, as new nurses acclimate to the practice environment they adopt the decision making processes of the organization or the cultural context in which they practice (Foley, Minick, & Kee, 2002). Newer nurses are oriented by more senior nurses as to the advocacy role of the nurse within the practice environment (MacDonald, 2006). The Husted theory provides a theoretical basis for understanding the complex interaction between nurse decision-making (to advocate) and the environment or the culture in which the nurse cares for patients. To better understand this interaction it is important to first consider the culture of patient safety and patient advocacy as individual concepts.

**Patient safety culture.** Patient safety culture is defined as “management and staff values, beliefs, and norms about what is important in a health care organization, how the organizations members are expected to behave, what attitudes and actions are appropriate and inappropriate, and what processes and procedures are rewarded and punished with regards to patient safety” (Sorra & Dyer, 2010. P.199). In essence, the patient safety culture sets the context within which a nurse delivers care to her patients. If patient advocacy is rewarded within the culture the nurse will be encouraged to advocate and if it is punished the nurse is then not encouraged to act on behalf of the patient (Affonso et al., 2003; MacDonald, 2006). Patient safety culture is a broad concept that encompasses the nurse’s relationship with organization leaders, peers, professional colleagues and patients. Context for Symphonology is specific to a single interaction; therefore, the connection between culture and context in nurse-patient interactions requires more discussion.
Context as previously defined is, “The interweaving of the relevant facts of a situation – the facts that are necessary to act upon to bring about a desired result, the knowledge one has of how to most effectively deal with these facts, and one’s awareness of what is relevant” (Husted & Husted 2008, p. 313.). A nurse’s propensity for advocacy is therefore based not only on the nurse-patient relationship but also on the broader context of the cultural norms and expectations regarding advocacy (Snowball, 1996).

Symphonology considers context to be three elements that when interwoven represent the relevant facts of a situation and necessary knowledge for the nurse as she takes action in the situation (Husted & Husted, 2008). The three elements include:

- Context of the situation – This is the identification of salient points of the situation that are necessary to understand in order to act. This is patient specific in that it is information about an individual patient’s situation.
- Context of knowledge – This is the overall knowledge that a nurse brings to the situation. It encompasses the nurse’s clinical knowledge and her prior experience.
- Context of awareness – This represents the nurse’s insight to recognize the needed knowledge and the patient situation and to act accordingly. It creates the bridge between the context of the situation and the context of knowledge.

The nurse’s actions in a particular situation are dependent upon her/his understanding of the context. When considering the connection between context and culture it falls within the context of knowledge. The knowledge that a nurse brings to a situation is learned during education processes but also through the usual practice she has experienced within a given culture. Cultural norms may or may not be within the best interest of a patient. If the nurse is
operating from misinformed knowledge then it is likely that the patient will not benefit from the interaction.

For example, let’s consider a patient that is experiencing post-surgical pain in the middle of the night. The nurse understands the situation in that she needs to provide pain relief; however, she has already given the patient all of the pain medication he was ordered but he continues to express pain. The nurse recognizes that she will need to contact the attending physician to get an order for additional pain medication. She sees the name of the physician on the chart and does not want to contact this physician because he has made it known in the past that he was not to be contacted for this type of issue in the middle of the night and then hangs up on the nurse without giving additional orders. She confers with the charge nurse and they agree to tell the patient that he will need to wait until the next scheduled dose of pain medication is due for administration. In this situation, the nurse chose not to advocate in the best interest of the patient and instead to follow the cultural norm of the organization because she has prior knowledge regarding the likelihood of receiving an order for additional pain medication. This is an example of the effects of culture on a nurse’s actions within the context of an individual situation. A culture of medico-centrism (physician centered culture) increases the need for advocacy efforts, however, at times places a nurse in an antagonist role with physicians (McGrath, Holewa, & McGrath, 2006). Establishing a hospital culture that is centered on the patient enables nurses to enact their advocacy role without fear of reprisal.

The fact that a nurse is following the cultural norms of an organization does not make the decision ethically correct. It does, however, help to explain how one or more of the principles of bioethics could be violated when a nurse is not supported in the advocacy role. In this case the
nurse did not serve as the patient’s agent which is an implicit role the nurse agrees to serve within the nurse-patient agreement (Husted & Husted, 2008).

**Patient advocacy.** Patient advocacy is defined as “a process or strategy consisting of a series of specific actions for preserving, representing, and/or safeguarding patients’ rights, best interests, and values in the healthcare system” (Bu & Jezewski, 2007, p. 104). For the purpose of this study, advocacy is considered on an individual patient level and not at the macro level such as the public health advocacy.

Advocacy executed by a nurse on behalf of a patient is part of the intrinsic agreement between the nurse and the patient. Husted and Husted (2008) define this nurse-patient agreement as an intrinsic understanding between the nurse and patient that the nurse will act on behalf of the patient to do as the patient would do if they were able. The nurse becomes an extension of the patient to advocate for the patient as they would themselves if the patient were able (Husted & Husted, 2008). Without this basic understanding that the nurse will advocate for the patient, the nurse-patient relationship would not make logical sense.

Symphonology does not specifically use the term advocacy but uses instead agency. Agency is defined as “The capacity of an agent to initiate and sustain action” (Husted & Husted, 2008, p. 311). The nurse becomes empowered to act as the agent for the patient when needed with the goal to return the patient to his or her own agency to the extent possible. In Symphonology, agency is situated within the bioethical standard of autonomy since it is through one’s autonomy, one’s uniqueness, that all the other standards are realized. The bioethical standards are considered preconditions of the nurse-patient agreement which bestow on every patient the right to be recognized as a unique individual. When the nurse acts as the
patient’s agent within the nurse-patient agreement she intrinsically agrees to recognize the patient’s uniqueness and to engage in decision making that respects the patient’s autonomy. Although agency and advocacy are not the same concept, agency becomes advocacy when situated in the nurse-patient agreement as both refer to taking action to achieve the patient’s objectives. The conceptual framework for this study is schematically depicted in figure 2.

![Conceptual Framework](image)

**Figure 2. Conceptual Framework for Study**
**Conceptual framework summary.** The Husted ethical decision-making theory Symphonology was outlined with particular emphasis on those concepts that pertain to this research. An application of the theory as it relates to patient safety culture and patient advocacy was provided with a focus on context, the bioethical standard autonomy and nurse-patient agreement. Evidence from the literature was reviewed indicating that advocacy and patient safety culture is situated in an ethical framework which led to the use of Symphonology for the purposes of this research.

**Literature Review**

A thorough review was conducted to answer the questions put forth in the beginning of this chapter. The review of the literature related to patient safety culture and patient outcomes is provided in manuscript form and can be found in Appendix A. There has been no identified research on the relationship between patient safety culture and patient advocacy therefore a review of studies that have considered patient advocacy, the culture of the work environment, and the impact on nurse sensitive patient outcomes is included below. A summary of the conceptual frameworks used to guide past research is included and gaps in the current research are noted.

**Relationship between patient safety culture, patient outcomes and advocacy.**

Patient advocacy is defined as “a process or a strategy consisting of a series of specific actions for preserving, representing, and/or safeguarding patients’ rights, best interests, and values” (Bu & Jezewski, 2007, p. 104). These authors propose that the nurses’ attitude toward patient advocacy connects safety culture and nurse sensitive patient outcomes as the nurses’ choice to advocate is influenced by the organization’s safety culture. If the culture is supportive
of the nurses’ advocacy role, negative ramifications for engaging in advocacy would be less, and the culture more attuned to patient safety. The following studies have investigated the relationship between patient advocacy and patient outcomes.

O’Connor & Kelly (2005) conducted qualitative research with the aim to gain an understanding of nurses’ perceptions regarding enactment of advocacy. The participants were 20 nurses practicing in Ireland including clinical nurse specialists, nurse managers and staff nurses. The researchers conducted a concept analysis to determine open ended questions that would be asked of the 20 nurses divided into three focus groups. The group interviews were transcribed and analyzed for themes. Nurses reported that their principle role as advocate was to act as a conduit between the health care environment and the patient in specific situations. The authors identified context, the nurse-patient relationship, and consequences as three of the themes. When nurses engaged in advocacy activities they reported that patient outcomes were positive. The nurses’ experience was not as positive due to conflicts with other care providers which led to strained professional relationships.

Blondal & Hallsorsdottir (2009) used phenomenology to study patient pain management as experienced by 10 nurses in Iceland. Several themes were identified which influenced nurses when advocating for the management of pain; the patient, moral dilemmas, gatekeepers (physicians) and organizational hindrances. Advocating for the patients’ wishes related to pain management was seen as essential. Nurses experienced moral distress when the organization’s policies, for palliative care patients in particular, did not coincide with the patients’ wishes. This study articulated the advocacy role of the nurse and the moral distress felt by the nurse when pain control was not achieved.
Hanks (2010) conducted a quantitative theme analysis on the narrative responses of Texan medical/surgical nurses who participated in a larger quantitative study. He examined the type of advocacy activities conducted by RNs and their organizations’ support of these activities. Nurses reported that organizational support directly impacted their advocacy ability. The most common types of advocacy included patient/family education, interdisciplinary team communication and questioning the plan of care.

Black (2011) conducted a descriptive study following a hepatitis exposure in Nevada to understand the reason why contaminated medication vials were reused. The negative patient outcome was already known in this case as many of the patients contracted hepatitis C as a result of poor infection control practices in the two clinics. A quantitative survey was sent to a sample of 1,725 Nevada RNs with a 33% response rate to determine if there was a statewide issue related to RNs implementing their advocacy role. Harmful infection control practices were witnessed by one third of the nurses surveyed however fear of retaliation prevented the nurses from reporting issues. Whistleblower legislation was enacted in Texas to improve the hospital culture of patient safety.

One of the four studies used a conceptual framework to view the concept of patient advocacy and to determine the narrative questions from which the theme analysis was drawn (Hank, 2010). The researcher used a combination of three models, his own, and two others. The other three studies did not cite the use of a conceptual framework indicating that the current research involving nurse advocacy and patient outcomes does not guide a researcher to any specific theory for use as a conceptual model.

These studies indicate a connection between the organizational culture and other care providers that act as gatekeepers with the nurse’s ability to satisfactorily advocate for the patient.
Three of the available studies report the nurses’ perception of patient outcomes related to advocacy efforts and the forth study pointed to the possibility for disastrous patient outcomes when advocacy efforts do not occur. The state of research connecting patient safety culture and patient advocacy is in its infancy. Additional research, both qualitative and quantitative, is needed to better understand the connection between advocacy efforts and patient outcomes. The available research does lend credence to the use of Symphonology as the conceptual framework for a study involving patient advocacy measures. These studies point to the importance of organizational culture and nurse/physician relationships to achieving optimal patient outcomes.

**Literature review summary.** A thorough review of the literature has provided answers to the questions posed in the beginning of chapter 2. There is some evidence that a positive patient safety culture improves patient outcomes. It was found that study design including the patient safety culture data collection tool and types of outcomes studied are important considerations. The literature provides direction to researchers when choosing level of analysis (hospital or unit), types of outcomes and types of nursing units for study.

The literature related to the relationship between patient advocacy and patient outcomes is sparse. Most research connecting advocacy and patient outcomes has been qualitative and exploratory by design indicating the need for continued research in this area. There have been no studies to date which have explored the relationship between patient advocacy and patient safety culture. The review of the literature points to a clear need for further study of patient safety culture, patient advocacy and their effect on patient outcomes.
Chapter Three
Methodology

Introduction

Chapter three provides the details of the methodology used to answer the research questions. The purpose of this study was to determine the relationship between and among patient safety culture, nurse reported attitude toward patient advocacy, and key nurse sensitive patient outcomes. The study design, setting, data sources, and participants are described and an explanation and justification for use of the measurement tools is provided. The statistical methods used for the data analysis to answer each research question are reviewed.

Design

The research questions posed in this study lent themselves to a quantitative design. The intent of quantitative methodology, as noted by Polit (2010), is to collect numeric information that can be analyzed using statistical methods and generalized to understand the phenomenon in a broad sense. This type of methodology was used because the phenomenon has been studied at the individual level and themes had emerged which could then be studied in the general sense using a quantitative approach.

Cross-sectional design with secondary data analysis. The quantitative approach chosen was a retrospective correlational cross-sectional design using nurse perceptions and patient outcome data collected in 2015. This type of design is used when data is simultaneously collected at a single point in time and the goal is to demonstrate a relationship between two or more variables (LoBiondo-Wood & Haber, 2006).
Sample

A convenience sample used in this study was 40 hospital adult medical/surgical units from 7 hospitals within one large health system which included 1045 medical/surgical RNs. The nurse and patient outcome data collected were a cross-section of nurse and patient perceptions and patient outcomes during 2015. The nurses participated in a culture of safety and attitude toward advocacy survey in December 2015/January 2016.

Inclusion criteria for the nurse participants in this study included:

- RNs were assigned to one of the study units.
- RNs were proficient in English.
- Participants were of various educational levels, age ranges and consisted of both male and female RNs.

Exclusion criteria included:

- RNs who were working in non-adult medical surgical units.
- Nurses in leadership or non-direct patient care positions.
- Nurses outside of the selected health system.

Unit types and sample size. The sample was narrowed from 40 to 23 medical / surgical units as there were 17 units that did not have a 20% RN response rate for the AHRQ HSOPSC and ABP. The type of unit was narrowed to medical / surgical units to limit the confounding variables which could have affected nurse sensitive patient outcome data when variability of unit characteristics increases. In addition, medical / surgical units had available patient experience data using a national data collection process (HCHAPS) which was not available for specialty units such as behavioral health and critical care.
Sample size. A power analysis was performed based on the main analytic technique of multiple linear regression using a desired power of .80, a .05 significance level and three predictors. A small effect size (.05) was estimated due to the lack of prior research available indicating the need for 159 participants to achieve adequate power. The safety culture survey was previously administered in 2014 within AHN with a 40 percent response rate. If a similar response rate had been obtained in the 2015/6 survey there would have been 418 participants indicating adequate power for this study.

Setting

The setting was one health network located within a Midwestern metropolitan statistical area consisting of 7 adult medical/surgical hospitals. The nurse sensitive patient outcome measures chosen for the study were centric to medical/surgical units therefore the study was limited to that type of unit.

Hospital characteristics. The hospital characteristics are noted in Table 1. Teaching status is either noted as teaching or non-teaching and hospital type is urban, regional or rural. Nurses organized by a union are noted as yes (organized) or no (not organized).

<table>
<thead>
<tr>
<th>Hospital</th>
<th># of med/surg Units</th>
<th># of med/surg RNs</th>
<th>Location</th>
<th>Teaching Status</th>
<th>Organized Nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
<td>286</td>
<td>Urban</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>166</td>
<td>Regional</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>183</td>
<td>Regional</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Measurement

To answer the research questions data was obtained from four sources as summarized in Table 2. The data was collected within the same timeframe.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>9</td>
<td>205</td>
<td>Regional</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>117</td>
<td>Urban</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>53</td>
<td>Rural</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>35</td>
<td>Rural</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 2

**Data Sources**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient safety culture</td>
<td>System administered Qualtrics</td>
</tr>
<tr>
<td>Nurses attitude toward advocacy</td>
<td>System administered Qualtrics</td>
</tr>
<tr>
<td>Patient experience</td>
<td>System contracted vendor (Press Ganey)</td>
</tr>
<tr>
<td>Patient falls and HAPUs</td>
<td>Health system’s risk management database (rL solutions)</td>
</tr>
</tbody>
</table>

Patient safety culture was measured at the nurse, nursing unit and hospital levels by the Agency for Healthcare Research & Quality (AHRQ) Hospital Survey on Patient Safety Culture (HSOPSC).
The dependent variables included nurse’s attitude toward patient advocacy as measured at the nurse level by the Attitude Towards Patient Advocacy Scale (APAS) Acting on Behalf of Patients (ABP) subscale and several patient outcome measures that included patient experience, falls, and HAPU. Patient experience with nursing was measured at the unit level by the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) patient experience survey administered by Press Ganey including only three nursing specific domains; communication with nurses, responsiveness of hospital staff and pain management. Additionally, HAPUs and patient falls captured by the health system’s risk management databases and measured at the unit level served as dependent variables.

The patient safety culture, advocacy, demographic and patient outcome data utilized for this research was collected by the AHN Department of Patient Safety and used to benchmark AHN hospitals with their peers internally and externally for quality improvement purposes. The independent variable was patient safety culture and the dependent variables included nurse’s attitude toward patient advocacy, and three nurse sensitive patient outcome indicators; patient experience, HAPUs and falls. The patient experience measures were collected by Press Ganey Corporation and reported to the Center for Medicare and Medicaid (CMS) to fulfill each hospital’s mandatory HCAHPS reporting requirement. The nurse sensitive patient outcome data definitions were those utilized nationally as both HAPU and falls data were reported to the National Database of Nursing Quality Indicators (NDNQI). As noted in the manuscript included in Chapter 2, choice of nurse sensitive patient outcome variables related to patient safety culture required consideration of the type of unit under study. Patient experience HAPUs and falls were found to be significantly correlated to patient safety culture when studying medical/surgical units.
**Patient safety culture.** The independent variable in this study was patient safety culture. The Hospital Survey on Patient Safety Culture (HSOPSC) was the tool chosen to measure the independent variable (Appendix B). There are several instruments that have been designed to measure patient safety culture (Singla et al, 2006). Of the available thirteen instruments, two are more widely utilized each having the benefit of a large comparative database and published psychometrics. The HSOPSC is one of these tools and the other is the Safety Attitudes Questionnaire (SAQ). The SAQ is a proprietary tool and therefore the organization under study chose to use the HSOPSC.

The AHRQ commissioned *Westat*, a research group, to develop the HSOPSC. (Sorra & Nieva, 2004). Common uses are for research purposes as well as in quality improvement programs at a hospital level. The 42 question, 12 subcategory scale measures three dimensions; outcome measures, unit level and hospital wide safety culture dimensions. Items are on a 5-point Likert-type scale ranging from strongly disagree to strongly agree with an additional two single item measures, patient safety grade and number of events reported. Eight of the twelve subcategories include both negatively and positively worded questions.

**Reliability.** Sorra and Dyer (2010) analyzed the internal consistency of the scale using data from the AHRQ database on 331 hospitals and 50,513 individual respondents. The only subcategory that did not meet the commonly accepted reliability statistic of .70 was perceptions of staffing. The Cronbach’s alpha ranged from .62 to .85. Table 3 includes the dimensions and associated Cronbach’s alpha coefficient in the Sorra and Dyer study.
Table 3

**HSOPSC Reliability Statistics**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Subcategory</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome measures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequency of event reporting</td>
<td>.85</td>
</tr>
<tr>
<td></td>
<td>Overall perception of safety</td>
<td>.74</td>
</tr>
<tr>
<td><strong>Unit level safety culture</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervisor/manager expectations</td>
<td>Supervisor/manager expectations and actions promoting safety</td>
<td>.79</td>
</tr>
<tr>
<td>and actions promoting safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational learning –</td>
<td>Organizational learning – continuous improvement</td>
<td>.71</td>
</tr>
<tr>
<td>continuous improvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teamwork within hospital units</td>
<td>Teamwork within hospital units</td>
<td>.83</td>
</tr>
<tr>
<td>Communication openness</td>
<td>Communication openness</td>
<td>.73</td>
</tr>
<tr>
<td>Feedback and communication about</td>
<td>Feedback and communication about error</td>
<td>.78</td>
</tr>
<tr>
<td>error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonpunitive response to error</td>
<td>Nonpunitive response to error</td>
<td>.78</td>
</tr>
<tr>
<td>Staffing</td>
<td>Staffing</td>
<td>.62</td>
</tr>
<tr>
<td>Hospital management support for</td>
<td>Hospital management support for patient safety</td>
<td>.79</td>
</tr>
<tr>
<td>patient safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hospital-wide safety culture</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teamwork across hospital units</td>
<td>Teamwork across hospital units</td>
<td>.79</td>
</tr>
<tr>
<td>Hospital handoffs and transitions</td>
<td>Hospital handoffs and transitions</td>
<td>.81</td>
</tr>
</tbody>
</table>

**Validity.** The development of the instrument included a literature review using content from both inside and outside of health care related to safety culture and patient safety. Examination of existing safety culture instruments was conducted to yield reoccurring dimensions noted in the literature and existing surveys. Two surveys in particular were utilized.
in the construction of the HSOPS, the Veterans Health Administration Patient Safety Questionnaire and the Medical Event Reporting system for Transfusion Medicine. Face validity was confirmed with the use of cognitive testing, a review of industry experts and pilot testing of 1,437 health care workers (Sorra & Nieva, 2004).

Construct validity was determined by confirmatory factor analysis and fit testing. The subscales were tested with intercorrelations to determine if the scales measured the construct and to eliminate duplication. Correlations between .23 and .66 were achieved. Construct validity was determined by assessing if the pilot results were consistent with researcher expectations of the relationships between subscales as seen in the literature and with other instruments. The pilot indicated that results were consistent with the literature in that individuals who reported the greatest number of events (errors) responded more positively in the areas of open communication environment and feedback on error reporting (Sorra & Neiva, 2004).

Nurses’ attitude toward patient advocacy. A review of the literature yielded one tool that measures the independent variable propensity toward patient advocacy, the Attitude Towards Patient Advocacy Scale (APAS) developed by Bu (2005) (Appendix C). Little is known about the APAS as it has not been widely utilized in research or quality improvement in the hospital setting.

The APAS is a 64-item scale comprised of three subscales; safeguarding patient’s autonomy (SPA), acting on behalf of patients (ABP) and championing social justice (CSJ). This scale was based on a mid-range theory that yielded three core attributes thus the three subscales (Bu & Jezewski, 2006). The SPA and ABP represent advocating for patients that are
able and willing to be involved in decision-making (SPA) and those who are not able or willing (ABP). These two subscales compose the micro societal advocacy. Macro societal advocacy is measured by the CSJ. Responses are scored on a 6-point Likert-scale including both negatively and positively scored items. The scale ranges from *strongly disagree (1)* to *strongly agree (6).*

The ABP subscale was chosen for this research for three reasons. First the use of the entire scale would be onerous to the staff members completing the survey and costly for the organization. Second the CSJ subscale measured a concept that was outside of the intent of this research. The last reason is because this researcher is interested in nurse decision-making and the ABP subscale better represents the thought processes of the nurse as they advocate for individuals who cannot advocate for themselves.

**Reliability.** Internal consistency reliability testing in a study conducted by Bu and Wu (2008) of the APAS yielded a Cronbach’s alpha of .96 and the subscales were .89 (SPA), .85 (ABP) and .95 (CSJ). Results indicate acceptable reliability of the entire sale and each subscale (Bu & Wu, 2008).

**Validity.** The APAS was developed following a review of the literature describing and testing patient advocacy. The results yielded a potential 171 items that could be used in the instrument construction. Face validity was originally established by two advocacy experts and one measurement expert who were asked to evaluate the 171 items for appropriateness in an advocacy survey. Items that were seen as irrelevant or repetitive were either removed or reworded. The result was an 84-item instrument that following further expert panel review and testing was reduced to 64-items (Bu & Wu, 2008).
Construct validity was confirmed using exploratory and confirmatory factor analysis. Items were subjected to a Principal Axis Factoring with acceptable results (Bartlett’s test of Sphericity P<.001) to confirm exploratory factor analysis. The confirmatory factor analysis (model fit test) was also significant indicating an acceptable model fit for the APAS and the three subscales.

**Patient experience.** Patient experience was measured by the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey, nurse sensitive questions only, administered by Press Ganey Corporation on behalf of AHN hospitals (Appendix D) as required by the center for Medicare and Medicaid Services (CMS). The purpose of the HCAHPS survey process is three-fold.

1. To obtain accurate information from patients regarding their perception of the hospital in which they recently received care that can be used in a valid way.
2. To standardize the platform by which hospitals submit patient experience data to provide the opportunity for consumers and health care payers to benchmark hospitals.
3. To incent hospital administrators to improve the patient experience by reducing reimbursement to hospitals that fall below the 50th percentile of all hospitals (Medicare.gov).

The HCAHPS survey was developed by the AHRQ at the request of CMS. The survey consists of 32 items, 7 demographic, 4 screening to direct patients to the appropriate next question and 21 substantive to measure the patient experience. The substantive items are divided into 6 composite topics with the number of items in each topic; “nurse communication (3), doctor communication (3), responsiveness of hospital staff (2), pain management (2), communication about medicines (2), discharge information (2)” (Medicare.gov). In addition,
there are two items related to hospital environment and two addressing the overall hospital rating. For the purpose of this research, the three composite scores that were selected as dependent variables include those which measure the patient’s experience with nurses, nurse communication, responsiveness of hospital staff and pain management.

The measurement scale used in the HCAHP survey varies, however the scale used in the items selected for this research is a 4-point Likert-type scale of 1 = never, 2 = sometimes, 3 = usually, and 4 = always (O’Malley et al., 2005).

**Reliability.** Internal consistency reliability testing using Cronbach’s alpha indicated that the three subscales to be used in this research report acceptable reliability. Rothman et al. (2008) report nurse communication at .85, nursing services (responsiveness of nursing staff) .71 and pain control .81.

**Validity.** Construction of the HCAHPS tool involved a comprehensive literature review, patient focus groups and input from industry leaders (O’Malley et al., 2005). The tool was tested extensively with a sample from 130 hospitals from three states involving a sample of 19,720 patients and was found to have face validity (Goldstein et al., 2005).

Concurrent validity was not assessed as there was not an available tool by which to compare the HCAHPS. However, an early study evaluating sensitivity of the tool found that there was significant variability between units within the same hospital and between hospitals (O’Malley et al., 2005).

**HAPU prevalence rate.** HAPU was defined as a pressure ulcer stage II, III, IV, and non-stageable deep tissue injury which developed after admission to a hospital (NDNQI, 2015). The prevalence rate was the number of patients who acquired a pressure ulcer after admission
to the hospitals divided by the total number of patients in the population studied at a single point in time. The rate for purposes of this study was the combined rate of the four quarters of calendar year 2015.

**Fall rate.** A patient fall was defined as an unplanned descent to the floor (or extension of the floor if another object is struck on that decent) (NDNQI, 2016). Both falls resulting from a physiological or environmental reason were included. Fall rate was the total falls per 1,000 patient days. The rate for purposes of this study was the combined rate of calendar year 2015. Data from the hospital system risk management database was used to determine the fall rate. This data was entered by the nurse caring for the patient at the time of the fall and staff were free from retribution when reporting adverse patient outcomes in this system.

**Data Collection**

**Data Collection for safety culture and nurse’s attitude toward patient advocacy.**

The sample consisted of 1045 RNs who met the inclusion criteria for participation in the study. The nurses completed the HSOPSC and ABP surveys online on the Qualtrics platform. Nurses were invited to participate in each survey via a link through an e-mail sent to their hospital e-mail account. When the surveys were completed, the data were electronically transferred to a data analyst employed by the parent company who de-identified on the Qualtrics platform to ensure the confidentiality of the respondents. RN perceptions and nurse sensitive patient outcome data from each medical/surgical unit was matched by using the nursing unit as the unique identifier.

**Data collection for the HCAHPS.** Patients who had been discharged from each hospital were randomly chosen to receive a mailed survey. The surveys may have been completed by
the patient or a significant other with all surveys being returned to Press Ganey. Press Ganey entered the data into the Hospital Compare data base and guaranteed the integrity of the data.

**Data Analysis**

Data analysis was performed using IBM SPSS version 24.0. Following were the procedures for missing data and data analysis.

**Missing data.** The data set was assessed by variable (by performing a frequency distribution and box plot) and participant for the extent and pattern of missing data or outliers to determine if steps needed to be taken prior to further analysis. Listwise deletion was used for the study participants with missing data. Given the number of participants in the research study missing data did not decrease the statistical power. Demographic data was analyzed to provide a description of the participants as well as to answer some specific research questions. Demographic information was not imputed and no demographic variables had greater than 20% missing data.

**Data analysis.** Preceding the hypothesis testing, a variety of descriptive analyses were performed to assess the distribution, missing data, and outliers for the variables of the nurse’s perception of the patient safety culture, the nurse’s propensity toward patient advocacy, the outcome variables of patient experience, HAPU prevalence rate, and fall rate, and the demographic traits of the nurse, including the overall rating and each subscale as applied. Descriptive statistics included frequencies for categorical variables and means and standard deviations for continuous variables.

Also preceding the hypothesis testing, an exploratory factor analysis was performed to determine the internal validity of the patient safety culture and advocacy scales with the study
sample. Although the instruments used had existing psychometric testing, an analysis of the structure of the data obtained from the instruments was important because reliability and validity are not permanently set. (Messic, et al., 2006)

*What is the relationship between the nurse’s perception of the patient safety culture and the nurse’s propensity towards patient advocacy?* This question was analyzed in an overall sense using the nurse’s overall rating of patient safety culture and then additionally by each of the 12 subscales. A bivariate Person correlation was used to determine the overall relationship between the two variables as well as each of the individual subscales. The assumptions for use of correlation included appropriate level of data, random sampling, bivariate normal distribution, homoscedasticity and linearity. The design of this study did not meet the assumption of random sampling however because the sample size was adequate, the use of correlation was appropriate even with the convenience sample (Polit, 2010). The assumption of bivariate normal distribution was assessed with histograms and by evaluating the skewness and kurtosis of the variables. Homoscedasticity was evaluated using scatterplots from the analysis. Linearity was assessed using scatterplots of the dependent variable against the independent predictor variable to determine if the relationship is linear. The assumption of normal distribution was not met for the advocacy scale therefore a log transformation of the composite scores was utilized in the correlation. The model summary from SPSS yielded the Person (r) and (r²). The squared r was used to determine the amount of shared variation between the two variables. Cohen’s (1988) criteria for interpretation of effect size was utilized (.20 small effect, .50 medium effect and .80 large effect).

*What are the relationships among nurse demographic characteristics, patient safety culture and attitudes toward advocacy?* A step-wise multiple regression best case scenario
approach was utilized to answer this question. This approach can be selected when there are no theoretical differences proposed in the model related to the variables (in this case the demographic variables) therefore entering the data in the order of the highest bivariate correlation is chosen (Polit, 2010). The assumptions for multiple regression include multivariate normality, linearity, and homoscedasticity. As noted above the raw data in the advocacy scale was highly skewed which violated the assumption of normality, therefore a log transformation was applied. Each demographic variable of interest, level of education, hospital unit, hospital employment length in unit, in the hospital, and as a RN was examined with the advocacy score as the outcome or dependent variable. The demographic traits that had the highest bivariate correlations were included in the final multivariable model to assess the adjusted association between nurse’s perception of patient safety culture, propensity towards patient advocacy and demographics. An inter-class correlation (ICC) was calculated due to the clustering effect of nurse’s data at the nurse, unit, and hospital level.

What is the relationship among nurses’ perceptions of patient safety culture, nurses’ attitudes toward patient advocacy and nurse sensitive patient outcomes (patient experiences with nurses, falls, and hospital acquired pressure ulcers (HAPUs))? Five exploratory multiple regression models were run with patient safety and advocacy as the predictor variables. The patient outcome data was aggregated down from the unit level to the nurse respondent level. This has been shown to shrink the standard errors thus increasing the t-values and indicating more statistically significant results than should be, therefore the significance level used for this analysis was p<.01. The multivariate equations used to analyze the data are noted below.

\[ Y(HAPU) = \beta_0 + \beta_1(PSC) + \beta_2(ABP) + error \]
\[ Y(\text{FALLS}) = \beta_0 + \beta_1(\text{PSC}) + \beta_2(\text{ABP}) + \text{error} \]
\[ Y(\text{PAIN}) = \beta_0 + \beta_1(\text{PSC}) + \beta_2(\text{ABP}) + \text{error} \]
\[ Y(\text{CALL LIGHT}) = \beta_0 + \beta_1(\text{PSC}) + \beta_2(\text{ABP}) + \text{error} \]
\[ Y(\text{Nurse Communication}) = \beta_0 + \beta_1(\text{PSC}) + \beta_2(\text{ABP}) + \text{error} \]

**Human Subjects**

This research utilized secondary analysis. The topic under study could have been sensitive to those nurses reporting their perception of patient safety culture and propensity for patient advocacy and could have been linked to an individual hospital or unit. To ensure anonymity the data obtained for this study was in de-identified form. All patient outcome data were aggregated to the nursing unit level and were not analyzed at the individual patient level which ensured anonymity. Permission for use of the data was received from the AHN’s Sr. VP of Operations. The advantage of participation to each hospital was to gain an understanding of the relationship between patient safety culture and patient advocacy and the opportunity to have further conversation among multidisciplinary team members related to this relationship. The health network had multiple urban and community hospitals so inferences can be made without identification of hospitals, nursing units or patients.

This study was submitted to both the Duquesne University and the AHN Institutional Review Boards with the request of exempt status as it was not within the definition of human subjects’ research given the design and de-identified nature of the data. The nurse participants in the study did not receive any direct benefits to participation in this study. The intent of this study was to determine the nature of the relationship if any between patient safety culture, patient
advocacy and patient outcomes. The results of the study were communicated to the organization which may increase the multidisciplinary team’s awareness of the role of the nurse related to patient advocacy resulting in the improvement of the nurses’ practice environment. The patients in this study did not directly benefit from the research. The participating hospitals and their patients may benefit in the future if improvements are made due to the results of this study.

Summary

The design chosen for this study was a cross-sectional design using secondary data analysis. The tools utilized in the research were described and noted to have acceptable levels of reliability and validity. The statistical analyses used to answer the research questions included bivariate correlations and multiple regressions. Human subjects were protected given the de-identified data obtained for use in this study and the research proposal was reviewed by both the educational institution and the health care institution IRBs.
Chapter 4

Results and Discussion

The results and discussion are presented as a full stand-alone manuscript prepared for publication in AMA format.

The Relationship Between and Among Perceptions of Patient Safety Culture, Nurse Advocacy and Nurse Sensitive Patient Outcomes

Abstract

OBJECTIVE: The purpose of the study was to understand the relationships between and among patient safety culture, nurse reported attitude toward patient advocacy, and key patient outcomes (patient experience and safety).

BACKGROUND: Nurses play an integral role in patient safety, providing care through constant interaction with the patient and clinical team. Advocating for patients is part of that role; however little research existed that explored how advocacy was related to the safety culture or specific patient outcomes.

METHODS: A correlational cross-sectional design was chosen for this secondary data analysis. Correlation and regression models were applied to medical/surgical unit data from seven facilities within one hospital system. Sources of data included the patient safety culture survey from the Agency for Healthcare Research and Quality (AHRQ), the Nurses’ Attitudes Toward Patient Advocacy (APAS) Acting on Behalf of Patients (ABP) subscale, the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey, patient falls and hospital acquired pressure ulcers (HAPU).
RESULTS: Significant findings included a weak to moderate correlation between patient safety culture and attitude toward advocacy, and a moderate negative correlation between safety culture, advocacy and years of experience as a nurse. No significant correlations were found between safety culture and patient outcomes or advocacy and patient outcomes.

CONCLUSIONS: Perceptions of experienced medical/surgical nurses within the participant hospitals were overall less positive about the patient safety culture and advocacy than their less experienced peers. These results raised questions as to whether adequate leadership attention was being given to the practice concerns of experienced medical/surgical nurses related to patient safety and advocacy.
Introduction

Nurses undeniably play an integral role in patient safety and advocacy as the care provider in constant interaction with the patient and the clinical team. As such, nurses have the unique opportunity and a professional obligation to advocate for patients to ensure their safety. Although advocacy is a core tenet of our profession, the incidence of nurse sensitive hospital acquired conditions remains at an unacceptably high rate in hospitals.(1) The negative ramifications of substandard care are personal for patients and financial for hospitals, yet the issues continue to exist.

The Institute of Medicine evaluated the state of patient safety in a landmark report To Err Is Human.(2) The report was a call to action for the healthcare industry to examine and improve poorly designed systems that were leading to errors in patient safety, and to promote a safety culture in which all care givers would be comfortable to raise concerns and advocate for their patients. The IOM cited the lack of administrative focus on safety culture as one of the primary reasons for systemic hospital acquired conditions, which subsequently initiated wide-spread concern at the hospital C-suite level. In an effort to encourage the health care industry to improve quality, the federal government levied financial penalties on organizations that fell below the expected levels of performance through the Affordable Care Act.(3) Aligning financial payment to patient outcomes was the chosen strategy to expose the cost of poor quality and to lower the overall cost of care by decreasing preventable injury to patients.

Attention to patient safety has undeniably increased since the IOM report was published, however nurse sensitive hospital acquired conditions continue to occur at unacceptably high rates.(1,4) If we as nurses consider advocacy as a professional obligation and have put considerable efforts into safety culture, why have we not been more successful in the reduction
of these conditions? The purpose of this study was to examine safety culture, advocacy, nurse demographic characteristics and nurse sensitive patient outcomes to determine if relationships existed that could provide insight into this important issue.

**Literature Review**

A review of the literature demonstrated that as the safety culture improved, nurse sensitive outcomes, specifically patient experience, hospital acquired pressure ulcers (HAPUs), and incidence of falls, improved as well. The practice setting for the current study was medical/surgical units so only those studies that included this type of unit are presented below.

Three cross-sectional studies were published that reported positive correlations between higher safety culture ratings and patient experience scores. Gearhart studied 287 nurses and physicians and 216 patients on three hospital medical/surgical units within three separate hospitals in one city in the United States.(5) A significant relationship (p ≤ .001) was reported between increased safety culture ratings, (specifically the subscales related to overall perceptions of safety, organizational learning, teamwork within units, non-punitive response to error, staffing, management support and teamwork across units), and increases in the patients’ rating of nurse communication, responsiveness of the staff and pain control. Effect sizes were calculated using incident rate ratios (IRR) with organizational learning as the strongest predictor variable (89-96% of the change in the patient experience ratings was predicted by the organizational learning score) and the other statistically significant subscales between 36-84%. Abrahamson et al. conducted another study with 135 units, of which 64 were medical/surgical within 45 hospitals throughout the United States. A significant positive relationship was found between higher scores in nurse communication and higher scores in safety culture, in particular the
subscale related to staffing \( p = .002 \). (6) Aiken et al. found a significant positive relationship between patients’ perceptions of nurse communication and the nurses’ perceptions of safety as reported by a hospital safety grade (odds ratio .94, confidence interval .9 to .98). (7) This very large study included over 60,000 nurses and 130,000 patients from the United States and Europe. (7) Across all studies, patient reported nurse communication scores increased when nurses reported higher satisfaction with hospital safety culture.

Two very large studies linked safety culture and HAPUs and falls. Taylor studied the relationship between safety culture and HAPUs and safety culture and falls using a cross-sectional design with a convenience sample of nurses working on 29 nursing units (including ICU and medical/surgical) and 28,260 patients within one academic medical center. (8) The results indicated a negative relationship between nurse perception of safety culture and HAPUs \( (p < .01, \text{ odds ratio } 0.383) \) meaning as safety culture scores increased, HAPUs decreased. Brown and Wolosin examined safety culture and nurse sensitive outcomes (HAPUs and falls) in nine hospitals in California on 37 nursing units. (1) The results indicated that as the overall perception of patient safety improved the unit had fewer HAPUs, \( r=-.349 \) and as teamwork within the nursing unit improved the number of falls decreased, \( r=-.327 \).

While the literature suggests that safety culture and patient outcomes are correlated, the relationships among patient advocacy, culture, and patient outcomes are not as clear. The published work has focused on the experience that nurses had when advocating for patients, the cultural and organizational impediments to advocacy and the nurses perception of the impact to patient outcomes.

In an effort to explore the impact of organizational culture on advocacy and patient outcomes, Hanks conducted a large quantitative theme analysis (a subset of a larger study) on the
narrative responses of 325 Texan medical / surgical nurses. Nurses reported various levels of organizational support which directly impacted their ability to advocate for patients. The top three types of advocacy were education of the patient or family, communication with the care team, and questioning to ensure adequate care, with 15.6% of nurses reporting that their advocacy efforts were performed to ensure the outcome of patient’s safety.(9)

In an effort to examine the relationship between advocacy and a specific safety outcome, a descriptive quantitative study with a sample of 1,725 RNs was conducted following a hepatitis exposure in Nevada due to the reuse of contaminated medication vials. One third of surveyed nurses reported that they had witnessed practices that could cause harm to patients, however they did not report these practices because of fear of retaliation or belief that there would be lack of follow up on their concerns. These findings indicated that the organizational culture in Nevada hospitals was not consistently conducive to safe patient care, resulting in the enactment of whistleblower legislation in Nevada.(10)

Qualitative work has also been conducted, in an effort to gain a more in-depth understanding of medical/surgical nurses’ perceptions of their experience when enacting advocacy. O’Connor and Kelly (2005) studied 20 nurses in focus group interviews in Ireland of which 7 were a focus group of medical/surgical nurses. Following a theme analysis they found that nurses reported positive patient outcomes as a result of their advocacy efforts, and that the advocacy role centered on the nurse-patient relationship within the context of the unit dynamics. Unfortunately, they also frequently experienced conflict and confrontation when engaging in patient advocacy activities, often at the detriment of their professional relationships, primarily with physicians.(11) Another study examined the perceptions of 10 experienced nurses in Iceland when caring for patients in pain. The researchers identified key themes that influenced
the nurse’s experience: the patient, moral dilemmas, gatekeepers (physicians) and organizational hindrances. Being able to bring the voice of the patient to the physician for a discussion on pain management was seen as essential to a positive patient outcome. In addition, the organization’s culture and policies related to palliative care often led to issues of moral distress for nurses. Nurses reported the experience of pain management to be positive when the patient outcome was relief of pain, and subsequently negative when pain control was not achieved.(12) Although the state of research connecting patient safety culture and patient advocacy remains in its infancy, the studies noted above indicate a connection between the organizational culture and other care providers that act as gatekeepers, shaping the nurse’s ability to satisfactorily advocate for the patient.

**Theoretical Framework**

The Husted theory of ethical decision-making (Figure 1)(13) provided the theoretical framework for describing the complex interaction between nurse decision-making (specifically the decision to advocate) and the environment or the culture in which the nurse cares for patients. Husted’s model offers a theoretical basis for the relationship between advocacy and culture, with particular emphasis on context and the bioethical standard autonomy.(13) The nurse’s decision to act on behalf of the patient, thus preserving the patient’s autonomy, is made while weighing cultural and personal ramifications of taking action. Each nursing unit has a unique culture that provides the context for patient care on that unit, and that context includes the relationships between nurses, physicians, and unit leadership. For example, a nursing action might be in the best interest of the patient, but may not be supported by peers, members of the medical staff or unit, and hospital leadership. It is not helpful to assess attitude toward advocacy without also
considering the context of the nurse-patient interaction.(14,15) Nurses graduate their pre-licensure programs having learned about the nursing code of ethics (16) and the role of the nurse to advocate for vulnerable patients. However, the new nurse’s practice quickly becomes situated within the cultural context of the organization and/or unit in which they practice, and the nurse-patient relationship and attitude toward advocacy are directly impacted by the cultural context.(17) Notably, one multi-hospital and country study found that cultural differences were greater within hospitals than across hospitals or countries.(18) These differences directly impact and shape the advocacy role of the new nurse, and emphasizes the importance of unit level culture.(19)

The Husted Model also assimilates context in terms of the nurse’s knowledge and awareness which includes the nurse’s experience and education level. Studies have established the relationship between a higher percentage of baccalaureate-prepared nurses and patient outcomes such as decreased length of stay in high risk patients (20), and lower mortality and complications in surgical patients.(21)

**Methods**

The purpose of this study was to examine the relationships among safety culture, advocacy, nurse demographic characteristics and nurse sensitive patient outcomes. Participants were all staff RNs employed on a medical/surgical nursing unit in the health system of study who were proficient in English.

**Design and Approach**

This correlational cross-sectional study utilized a sub-set of data collected by the health system during a prior survey. The purpose of the parent study was to assess and provide areas for
improvement of the current safety culture. The parent study’s potential sample consisted of 12,047 health system employees, of which 4,199 (35%) completed the patient safety culture and advocacy surveys in the months of December 2015 and January 2016. The advocacy survey was completed only by RNs within the system. Both surveys were launched using the Qualtrics platform, ensuring anonymity to the respondents. The focus of this secondary data analysis was a subsample of 1,045 staff RNs that practiced on one of 40 medical/surgical or telemetry units throughout the 7 hospital system. The patient outcome data was available at the unit level only. Patient experience data was obtained from a random sample of patients discharged from each hospital who received a mailed survey which was completed by the patient or significant other and mailed to Press Ganey. The data was entered into the Hospital Compare data-base by Press Ganey, one of the approved vendors by CMS. Press Ganey Corporation guaranteed the integrity of the data. Patient falls and HAPU data were obtained from the hospital risk management system.

**Measurement**

Patient safety culture was measured using *The Hospital Survey on Patient Safety Culture (HSOPSC)*. The HSOPSC was developed for the AHRQ by a contracted research group, Westat, and made available in 2004 for hospital use. A total of 42 questions on the scale have been divided into 12 subcategories, and grouped into three dimensions: outcome measures, unit level and hospital wide safety culture dimensions. The individual responses were on a 5-point Likert-type scale ranging from strongly disagree to strongly agree. In addition, there were two single item measures that do not have an alpha statistic reported: patient safety grade and number of events reported. The 12 subscales were analyzed for internal consistency using data from the AHRQ database on 331 hospitals and 50,513 individual respondents.
Advocacy was measured using the APAS developed by Bu.(23) Unlike the HSOPSC, the APAS had not been widely utilized. The APAS had a total of 64-items divided among three subscales; safeguarding patient’s autonomy (SPA), acting on behalf of patients (ABP) and championing social justice (CSJ). The three subscales corresponded to the three core attributes in a mid-range theory developed by the author of the instrument and a colleague.(24) Only one of the subscales (ABP) was used in this research as it best represented the type of advocacy used in medical / surgical nursing practice. In addition, the use of all three scales would have been onerous for the staff and costly for the institution. Responses were scored on a 6-point Likert-scale ranging from strongly disagree (1) to strongly agree (6).

The choice of nurse sensitive patient outcome variables was determined following a literature review that examined prior research on patient safety culture and patient outcomes. The variables chosen for this study were selected due to significance in past studies involving medical/surgical units (patient experience, HAPUs, and falls), or because variation was expected across medical/surgical units. In the studies that included mixed ICU and medical/surgical units, patient falls were not found to be a significant outcome measure most likely due to the low number of falls that occur in the ICU setting.(25,26)

Patient Experience was measured by the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey (27) administered by Press Ganey Corporation on behalf of the hospital system. The Center for Medicare and Medicaid Services (CMS) required acute hospitals to contract with an approved vender and submit results to CMS. These results were entered into the Hospital Compare database and were made available for health-care consumers to access. The survey consisted of 32 items, however only three nurse sensitive subscales comprising of a total of seven question were chosen for the purposes of this study:
nurse communication (3), responsiveness of hospital staff (2), and pain management (2). The scale used in the items selected for this research was a 4-point Likert-type scale of 1 = never, 2 = sometimes, 3 = usually, and 4 = always. The CMS publicly reported data was the percentage of “4s” or “always” answers called top box. The HCAHPS unit scores in this study were based on top box scores from calendar year 2015. Internal consistency reliability was tested using Cronbach’s alpha, which indicated that the three subscales used in this research had acceptable reliability. Rothman et al. reported nurse communication at .85, nursing services (responsiveness of nursing staff) .71 and pain control .81. Internal consistency was not tested in the current study as the raw data was not available to the researcher.

A HAPU was defined as a pressure ulcer stage II, III, IV, and unstageable deep tissue injury which developed after admission to a hospital. The HAPU rate was the total number of HAPUs in calendar year 2015 per 1000 patient days. Data from the hospital risk management database was used to determine the HAPU rate.

A fall was defined as an unplanned descent to the floor (or extension of the floor if another object was struck on that decent) which resulted from a physiological or environmental reason. Fall rate was the total falls in calendar year 2015 per 1,000 patient days. Data from the hospital system risk management database was used to determine the fall rate.

Data Analysis

Only those units with a 20% or greater response rate were included in the study, with the final sample consisting of 23 medical/surgical units and 211 nurses from the 7 hospitals. The number of units was between 1 and 7 per hospital. The analysis also contained data sets at the individual and unit levels, therefore it was necessary to account for the lack of independence between the individual, unit, and hospital level data. Because individuals are nested within units and units
within hospitals, the interclass correlation of the scores at the individual level within the units and hospitals was examined. Interclass correlation (ICC) is the relationship between the Mean Squares of the between and within variance therefore the closer to one, the more the variance is due to differences from being within a group. The ICC can also be interpreted as the correlation between any two randomly chosen individuals in the group. The data was assessed by variable and participant for the extent and pattern of missing data and outliers. There was no missing data from the safety culture survey and 34 participants that did not complete the advocacy survey in its entirety. Listwise deletion was used for the study participants with missing data because the majority of the questions were left unanswered in these 34 surveys. Statistical significance was defined as $P \leq 0.05$. IBM SPSS (V.24.0) was used to perform the statistical analysis.

The nurses’ responses to the safety culture survey were reported as the percentage of positive responses (PPR) therefore respondents who rated the safety culture as either agree or strongly agree were included in the PPR. An exploratory factor analysis (EFA) on the data from this study was performed using R-Studio (ver 1.0143) with Psych Package (ver. 1.7.5) due to the dichotomous data to determine if a total combined score of the 12 composite scales could be used in the analysis. The Cronbach’s alpha was .93 indicating strong internal consistency within the 12 composite scales therefore the combined score was used in the analysis. (Technical Appendix A).

The advocacy scale was scored on a 1 (mean score of 1-3) to 4 (strongly agree) scale due to the propensity for positive responses. Because the raw data was severely skewed toward positive responses, a Log 10 Reflect transformation (logR) was applied to the advocacy responses. The interpretation of results was in reverse, indicating that a low logR signified a
greater propensity towards advocacy. An exploratory factor analysis with weighted least squares and oblique rotation was performed and the results indicate a dominant factor and yielded a Cronbach’s alpha of .95. (Technical Appendix B)

The relationship between safety culture and advocacy was tested using a bivariate correlation. Descriptive statistics for participant demographics were expressed in percentages and means. The relationships between the demographic characteristics, safety culture and advocacy were tested using a one-by-one best case scenario multiple regression approach. Specifically, each demographic variable of interest, level of education, hospital unit, hospital, employment length in unit, employment length in hospital, and length of time as a registered nurse, was examined independently with advocacy scores as the outcome variable. The variables were input in a backwards removal technique. This allowed for all variables to be included in the first model, and then those variables not statistically significant related to the outcome were removed in the second model. (34) Residuals, Cook’s Distance, Mahalanobis, and Leverage values were tested and all were well within acceptable levels. Residuals had a mean of zero and a standard deviation of one. Cook’s distances were all less than .07. The largest Mahalanobis distance was 7.482 and well below critical values with 2 predictors and 177 cases. Finally, Leverage values were all less than .05 based on using \(3*(k+1)/n\) where k is the number of predictor variables and n is the sample size. (35)

Four exploratory multiple regression models were run to test the relationship between perceptions of safety culture, advocacy and the patient outcomes. The patient outcome data was aggregated down from the unit-level to the nurse respondent level. This has been shown to shrink the standard errors thus increasing the t-values and indicating more statistically significant results than should be. To compensate for this increase in power, the cut off for the p was set at .01.
IRB approval

IRB approval was obtained from the health system as well as the university in which the researcher was a doctoral student. This study was granted exempt status by both IRBs.

Results

Descriptive Statistics

The majority of the participants worked in the hospital for 5 years or less (51.7%), on their unit 5 years or less (60.7%), had an associate’s degree as their highest level of education (38.9%) and were female (77.3%) (Table 1). The mean and standard deviation of the safety culture scale were 20.67 and 9.88. There were 211 completed surveys and none incomplete. The mean and standard deviation of the advocacy scale were 88.94 and 12.59, with scores ranging between 17 and 102. There were 177 completed surveys and 34 incomplete. See table 2 for complete descriptive data of scales and subscales. The mean (standard deviation) of the five patient outcomes variables were; nurse communication 76.0%(4.2), call light response 59.8%(7.1), pain management 66.1%(5.3), fall rate 3.5(1.3), and HAPU rate 1.2(.8).

Perceptions of safety culture and advocacy

To examine the relationship between safety culture and advocacy, two bi-variate Pearson correlations were run between the composite of the 42-item safety culture scores and both a composite of the advocacy scores and the log transformation of the composite of advocacy scores. The Person correlation before the log transformation was p=.333 and the Pearson correlation after the log transformation was = -.29. Following the log transformation higher scores on the advocacy scale indicated lower advocacy values. The correlation between the two was small to moderate, approximately 9% shared variance. The correlations between advocacy
and the total safety culture score as well as each of the safety culture 12 subscales are provided in Table 3.

**Relationships among nurse demographic characteristics, safety culture and advocacy**

To examine the relationship among nurse demographic characteristics, safety culture and advocacy a one-by-one best case scenario approach was utilized. Education level, a categorical variable, did not vary statistically significantly by advocacy scores ($F(3,170) = 2.24, p=.09$). On a technical note, we do acknowledge an inter-class correlation (ICC) of .31, indicating some of the variance noted was due to the nurse being within a specific educational level category (associates degree, diploma, BSN or MSN).

Length of tenure in the unit, in the hospital, and as a nurse were statistically significantly associated with advocacy scores ($F(5,171) = 2.26, p = .05$), ($F(5,171) = 2.69, p = .02$) and ($F(5,168) = 2.83, p = .02$), respectively, which indicated that longer tenure was associated with lower advocacy scores. Again, due to the nested nature of the data, the ICC scores were quite high in the unit and hospital analysis at .40 and .41, which indicated a nesting effect of the scores based on the length of time a nurse worked in a specific unit and hospital. The nesting effect may have been present because the data was gathered at the nurse level, and rolled up into unit and hospital levels; therefore the nurse level data is nested in the unit level data and then within the hospital level data.

Based on those results, a multiple linear regression model with safety culture scores, tenure in the hospital and tenure as a nurse as independent variables and log of the advocacy scores as the outcome variable was examined. Length of tenure in the unit was not included because it is highly correlated with the time in the hospital and was the weakest association to be statistically significant. The significance level for the p value was set at .025 as two linear
regressions were run on the same data. Both models were statistically significant at the p ≤0.025 level (Table 4). For every unit increase in the safety culture score there was a -.23 drop in the advocacy scores. For every one unit increase in length as a registered nurse (a one category move), there was a .18 increase in the advocacy scores indicating length of time as a nurse was predictive of a less positive attitude towards patient advocacy. Both models accounted for 11% of the variance in advocacy scores.

Relationships among perceptions of safety culture, attitudes toward advocacy and patient outcomes.

Four exploratory multiple regression models were run with safety culture and advocacy as the predictor variables and a nurse sensitive patient outcome as the outcome. Each analysis included one of the outcome variables (nurse communication, call light response, pain management, falls or HAPUs) as well as patient safety and advocacy. None of the exploratory models yielded statistically significant results. Specifically, the model results were, for nurse communication F(2,174) = 0.927, p = 0.398, call light response F(2,174) = 1.087, p = 0.341, pain management F(2,174) = 0.187 p + .830, falls F(2,174) = .32 p = 0.396 and HAPUs F(2,174) = 1.086, p = 0.346.

Discussion

This study was one of the first to examine the relationship between safety culture, advocacy and patient outcomes. While a positive relationship was found between safety culture and advocacy, a more notable relationship was found between the tenure of the nurse and their perception of both safety culture and advocacy. Although the relationship between safety culture and advocacy
was significant, the results including patient outcomes were not significant in this study, which is contrary to the published literature.(1,5,6,7,8)

The correlation found between patient safety culture and nurses’ attitudes toward advocacy indicated that there was a relationship between the context of the nurses’ work environment, the safety culture, and their attitudes toward advocacy. In addition, the following subscales were also statistically significant; teamwork within units, hospital management support, feedback and communication about errors, communication openness, teamwork across units and hospital handoffs and transitions. The results of this study were consistent with several research studies that have linked advocacy and culture.(9,10,11,12) Given the low shared variance between safety culture and advocacy, it is probable that there were other forces, such as the tenure of the nurse that played a more significant role in the positive findings.

In this study, moderate negative correlations were found between safety culture, advocacy and tenure as a nurse, both within the hospital and within the unit. This finding was unexpected, therefore a review of the literature was conducted to situate the findings. Although no studies were found directly linking these specific concepts (culture, advocacy and tenure of the nurse), there have been studies in the work environment satisfaction literature comparing the experience level of the nurse and satisfaction with the work environment. The focus of this study was medical/surgical nurses; therefore it’s important review previous work regarding senior medical/surgical nurses that may explain the findings. When considering the current study within the context of the available literature on senior medical/surgical nurses and medical/surgical nursing in general, the results are more understandable. The key contributor found in the literature was the additional workload pressure faced by senior medical/surgical nurses that in turn led to patient safety concerns. A nurse’s perceived ability to deliver high quality care has
been found to be directly related to workload, staffing and the nurse to patient ratio. (6, 7, 36) Research has shown that high quality care is perceived as more important by senior nurses and therefore these nurses place a higher emphasis on quality of care than younger nurses. (37, 38) It has been documented that more senior nurses reported quality of care issues related to workload pressure as they cared for patients while they served as resources to younger nurses. (36) In addition, 60.7% of the nurses had five or less years of experience in the current study. This ratio would place senior medical/surgical nurses in an adverse situation, as noted in the literature, where they are often charge nurses responsible for the overall quality of patient care provided by their less experienced colleagues while also caring for their own patients. (36)

The non-significant results in the comparisons between patient safety culture, advocacy, and patient outcomes were also not anticipated, as previous studies had reported significant results in the medical/surgical patient population related to patient safety culture. (1, 4, 7) The lack of variation on unit falls, HAPUs and patient experience data might have explained the non-significant results between patient safety culture, attitude toward advocacy and patient outcomes. All of these units were part of one network system that had targeted quality improvement initiatives surrounding these unit measures during the timeframe of the study. The study inclusion criteria of units that had 20% or greater respondents to the safety culture survey could also have contributed to the non-significant results because smaller units were included that had only a few respondents. Therefore, the study could be under-powered for the unit level analysis of patient outcomes.

The non-significant results in the comparison between education level, safety culture, advocacy and patient outcomes was also not expected, as previous studies reported significant results related to education level and patient outcomes. (20, 21) One study compared the nurse’s
perception of the nursing work environment (nurse perceptions of manager, unit and peer support) with the educational preparation of the nurse. (39) The results indicated that nurses with greater than 15 years of experience and prepared at the baccalaureate level had statistically significantly greater nurse satisfaction and perceived greater support than did their colleagues who were prepared at the associates degree level. In the current study, the majority of nurses were prepared at the associate and diploma degree level which could help to explain why tenured nurses perceived less teamwork and support in the work environment than younger nurses.

While the theoretical relationship between safety culture, advocacy and tenure of the nurse seems to be supported, other relationships were not. Culture did not vary significantly between units and hospitals, as was expected. Therefore, although there was a relationship between patient safety culture and advocacy, the variation was more likely due to the tenure of the nurse and not as strongly related to the practice environment. The convenience sample used in this study may have been too homogeneous, and a larger more diverse population of units would potentially have yielded more varied results. The number of staff members who participated in the study on each unit also varied widely which could have affected the results.

**Implications for Practice, Education and Research**

This research has implications for nurse leader practice and future inquiry. As nurse leaders, it is imperative that within our practice we educate our teams and colleagues on the advocacy role of the nurse and the real possibility of negative patient consequences when this role is not respected. The correlation between safety culture and advocacy provides a starting point for a conversation among nursing and medical staff leadership. Providers count on nurses to keep their patients safe, however they often don’t understand their own role in setting a positive culture in
which nurses can freely advocate. Nurse leaders are in the position to improve the safety culture of all nursing units and in specific medical/surgical units in ways that enable nurse advocacy. The findings of this study have indicated that a focus on teamwork, communication, management support and staffing could assist to improve the environment so that nurses are able to better advocate in the medical/surgical setting.

Additionally, the findings of this study indicate that nurse leaders must work towards bridging the academic preparation of the nurse with the organizational culture the nurse works within. New nurses are expected to adapt to the organizational culture therefore nurse leaders must ensure that the culture is one that preserves the ideals on which nursing practice is founded. Encouraging tenured nurses to continue with academic inquiry by obtaining baccalaureate level education and beyond may serve to reconnect tenured nurses to those ideals so they may serve as role models in the connection of academe and service.

Finally, the results of this research indicate that several opportunities exist for additional inquiry particularly in the relationship between safety culture and advocacy, safety culture and nurse tenure, and safety culture and patient outcomes. Further investigation of the relationship between safety culture and advocacy in critical care and perioperative departments is warranted as these clinical areas care for some of the most vulnerable patients who are in the greatest need for advocacy. Interventional research related to strategies to improve safety culture and the work environment for medical/surgical nurses and the associated financial and clinical outcomes achieved would benefit nurses and the organizations in which they practice. Additional research is also necessary to better understand the complex relationship between the safety culture, advocacy and the patient outcomes achieved.
Limitations

Units with 20% or greater participation were included in the study meaning smaller units could have had a low number of participants which could have influenced the non-significant findings between safety culture, advocacy and the patient outcomes included in the study. The nesting effect of the data (nurses within units) resulted in the data being used at multiple levels which could have an impact on the power of the study. This study is limited in generalizability due to the use of a convenience sample within one hospital system in one area of the USA. Nurses in this study self-reported their perception of safety culture and advocacy which can be influenced by many factors outside of the variables under study.

Although there were several limitations to the study, there were also strengths. The cross-sectional design using data from the same time period and the availability of advocacy data provided the opportunity to study some variables that had not been studied in the past. Also the availability of a large number of medical/surgical units offered the opportunity to study some associations that have not been in the literature prior to this research.

Conclusions

The intent of this study was to investigate the impact of patient safety culture on advocacy and patient outcomes on medical/surgical units. This was unexplored territory and therefore the study yielded some expected and unexpected findings. The most important findings include the relationship between patient safety culture and advocacy and the impact of the tenure of the nurse. The findings serve to open dialogue surrounding the desired advocacy role of the nurse and the environment in which they practice as well as the importance of focus on the more senior medical/surgical nurses.
Reference List


   


Figure 1. Husted Ethical Decision Making Model

Husted and Husted, 2008
Figure 2. Conceptual Framework Schematic

Conceptual Framework

Organizational Patient Safety Culture (Relationship With Leadership)

Unit Patient Safety Culture (Peer Relationships)

Professional Safety Culture (RN/MD and Other Relationships)

Nurse/Patient Relationship (Nurse/Patient Agreement)
RN Attitude Towards Advocacy

Nurse Sensitive Patient Outcomes

Context

Falls
Skin Breakdown
Patient Experience
- Pain Management
- Responsiveness of Hospital Staff
- Nurse Communication

No intervention possible due to lack of literature connecting safety culture and advocacy
Table 1. Demographic Characteristics

<table>
<thead>
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<th>Group</th>
<th>Number in Group</th>
<th>Percentage</th>
</tr>
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<td>77.3</td>
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<td>Male</td>
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<td>Diploma Degree</td>
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<tr>
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<tr>
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<td></td>
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<td>20.9</td>
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<tr>
<td>1-5 years</td>
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<td>39.8</td>
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<td>6-10 years</td>
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<tr>
<td>11-15 years</td>
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<td>16-20 years</td>
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<td>7.6</td>
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<tr>
<td>21 years or more</td>
<td>16</td>
<td>7.6</td>
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<tr>
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<td></td>
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<td>21 years and above</td>
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Table 2. Descriptive Statistics Safety Culture (PSC) and Advocacy (APAS-ABP)

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<th>Scale/Subscale</th>
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<th>Maximum</th>
<th>Mean</th>
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<tr>
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<td>4.00</td>
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<td>Unit Grade Recoded 0-4</td>
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<td>2.446</td>
<td>.823</td>
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Table 3. Correlations of PSC with APAS

<table>
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<th>Shared Variance</th>
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<tr>
<td>PSC total and APAS ABP total</td>
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<tr>
<td>Teamwork within units</td>
<td>0.219**</td>
</tr>
<tr>
<td>Supervisor/manager expectations</td>
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<tr>
<td>Organizational learning</td>
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<tr>
<td>Hospital management support</td>
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<tr>
<td>Overall perception of safety</td>
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<td>Feedback and communication about error</td>
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<tr>
<td>Communication openness</td>
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<tr>
<td>Frequency of events reporting</td>
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<tr>
<td>Teamwork across unis</td>
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<tr>
<td>Staffing</td>
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<tr>
<td>Hospital handoffs and transitions</td>
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<tr>
<td>Non punitive response to error</td>
<td>-0.11</td>
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</table>

Note, these are negative due to the linear transformation. Thus lower scores on APAS indicate higher attitude towards patient advocacy. * Indicates statistical significance at the .01 level. ** Indicates statistical significance at the .05 level.
<table>
<thead>
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<th>Model</th>
<th>Outcome and Source of Variation</th>
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<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p-value</th>
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<td></td>
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<td>173</td>
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<td>2</td>
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<td>171</td>
<td>.226</td>
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<td></td>
<td>Total</td>
<td>43.411</td>
<td>173</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Technical Appendix A
Safety Culture (PSC) Scree Plot

scree plot

- Eigen values of components
- Component number
## Total Variance Explained

<table>
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<tr>
<th>Factor</th>
<th>Initial Eigenvalues</th>
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<th>Rotation Sums of Squared Loading</th>
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<td>Total</td>
<td>% of Variance</td>
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<tr>
<td>2</td>
<td>1.287</td>
<td>7.572</td>
<td>66.996</td>
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<td>3</td>
<td>1.006</td>
<td>5.915</td>
<td>72.911</td>
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<tr>
<td>4</td>
<td>0.671</td>
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<tr>
<td>5</td>
<td>0.588</td>
<td>3.460</td>
<td>80.320</td>
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</tr>
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<td>7</td>
<td>0.448</td>
<td>2.636</td>
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<td>8</td>
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<td>9</td>
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<td>0.314</td>
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<td>11</td>
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<td>12</td>
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<td>17</td>
<td>0.122</td>
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</table>

Extraction Method: Maximum Likelihood.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.
Technical Appendix C. APAS ABP Scree Plot

Scree Plot

Factor Number

Eigenvalue

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
References


Appendix A: Literature Review Manuscript

This is a non-final version of an article published in final form in the *Journal of Patient Safety*.  
http://journals.lww.com/journalpatientsafety/

The Relationship between Patient Safety Culture and Patient Outcomes: A Systematic Review  
Margaret Hardt DiCuccio RN, MSN  
Copyright © Journal of Patient Safety 2013
Abstract

Context In the past 13 years since the Institute of Medicine report To Err is Human was published considerable attention was placed on the relationship between patient safety culture and patient outcomes. Research to understand this relationship has been conducted, however now it is important to systematically review these studies to determine if there are tools, levels of measure and outcomes that have been shown to result in significant correlations.

Objective The purpose of this review is to evaluate the state of research connecting patient safety culture and patient outcomes to determine nurse sensitive patient outcomes that have been significantly correlated to culture of safety as well as commonly used tools to measure culture of safety in the studies with significant correlations.

Data Sources Published English only research articles were considered for the review. Only studies that directly measured patient outcomes in relationship to patient safety culture in hospitals involving registered nurses as a participant were included.

Results Evidence of relationships between patient safety culture and patient outcomes exist at the hospital and nursing unit level of analysis; however the number of studies finding statistically significant correlations particularly using nurse sensitive outcomes is limited.

Conclusion The findings from this review suggest that there are emerging trends indicating that the specific patient safety culture measurement tools, the level of analysis and selection of outcome measures are important considerations in study design. More research is needed to determine interventions that improve patient safety culture and outcomes.

Keywords: safety culture, safety climate, patient outcomes
**Introduction**

It has been over a decade since *To Err Is Human* was published by the Institute of Medicine (IOM). This groundbreaking report emphasized the responsibility of health care providers to examine flawed systems within their organizations with the aim to improve the clinical outcomes of patients. Also included was the need to develop a culture that encourages all staff members to raise concerns regarding practices that place patients at risk, or said a different way, to engage in advocacy activities to keep patients safe. In order to promote staff engagement in patient advocacy there is a need to improve psychological safety. Psychological safety is defined as a staff member’s comfort level to challenge someone more powerful and know that there will be no retribution. The impetus for improving hospital systems and psychological safety is the unnecessary patient deaths resulting from preventable errors. Nurses have patient advocacy as one of their core responsibilities yet all too often they do not feel safe and culturally supported to speak up when a patient is at risk.

Since the time of the original IOM report there has been significant attention given to the following activities:

- Defining the terms patient safety culture and climate;
- Developing tools to measure these concepts; and
- Conducting research to establish the relationship between safety culture / climate and patient outcomes.

The purpose of this review is to evaluate the state of research connecting patient safety culture and nurse sensitive patient outcomes. The review includes study designs, measurement tools, and an examination of outcomes that did and did not have significant correlations to patient safety culture. Gaps in knowledge and next steps for research on this topic are noted.
State of Research

The inclusion criteria for selection of the research articles will be outlined as well as search strategies used to find the data sources. The measurement of patient safety culture and patient outcomes in the studies will be described. Also the current state of research outlining the relationship between patient safety culture and patient outcomes is examined.

Inclusion criteria

In this review, patient safety culture is defined as “the values shared among organization members about what is important, their beliefs about how things operate in the organization, and the interaction of these with work unit and organizational structures and systems, which together produce behavioral norms in the organization that promote safety”4 p.400. Colla et al.5 defines patient safety climate as the measureable components of patient safety culture. Therefore, for the purpose of this review the term patient safety culture will refer to both culture and climate as it is all encompassing.

Studies measuring patient / family satisfaction or direct patient outcome measures (falls, hospital acquired conditions, readmission rates, hospital compliance to best practice guidelines, medication errors and mortality) were included in this review. Studies using healthcare professional’s perceptions of patient safety outcomes were not included due to the indirect nature of these measures.

The electronic databases used to locate the research articles were EBSCO host for Hospitals and Medical Institutions, OVID and ProQuest. These hosts include multiple data sources such as CINAHL, MEDLINE, psychology, sociology, healthcare leadership databases and dissertation abstracts. A manual search of references from the selected studies was also conducted. The Boolean search mode was utilized to ensure maximal capture. Concepts
searched included safety climate, safety culture, safety environment, patient outcomes, nurse sensitive outcomes, treatment outcomes, and outcomes research.

A total of 17 research studies were identified that connected the concept of patient safety culture to nurse sensitive patient outcomes as defined above. Many of these studies considered both nurse and patient outcomes. Nurse outcomes such as turnover, injury rates, and RN satisfaction are not discussed in this review as the focus is on patient outcomes only. This represents ten peer reviewed articles\(^4,8,10,12,13,16,17,18,21,22\) and seven dissertations\(^6,7,9,11,14,20,23\). A summary of these studies is provided in Table 1.

**Study Design**

The majority of the studies (16) used a cross-sectional descriptive design with one study\(^22\) using a qualitative design. The cross-sectional design used in these studies often involves secondary analysis of previously collected data at a specific point in time, when the culture of safety tool was administered, and then linking these results to various patient outcome measures collected from the participating health care facilities. Several of the studies used large convenience databases made available by a government source (state and federal databases) or by an organization (Agency for Healthcare Research and Quality (AHRQ) database or hospital system) and involved large samples sizes. This design allows the researcher to interpret extensive datasets with the use of regression analysis.

The authors of the qualitative study selected 11 hospitals in the United States that either ranked in the top 5% or bottom 5% in performance for acute myocardial infarct (AMI) mortality rates. Following participant interviews and a theme analysis it was found that the organizations with lower mortality emphasized problem solving and learning, communication at transitions and organizational values and goals that related to a positive patient safety culture as compared to
those organizations with higher mortality rates. There was no common protocol regarding the care of the AMI patient indicating that the positive outcome went beyond protocols and into the culture of the organization. The results lend credence to the effect of patient safety culture on patient outcomes, in this case patient mortality, and the importance of senior leadership engagement to improve the culture.

Measurement of patient safety culture

Patient safety culture was measured using eight different tools. The two most frequently used scales were the Safety Attitudes Questionnaire (SAQ) Hospital\textsuperscript{6,7} Intensive Care Unit\textsuperscript{8,9} and the AHRQ Hospital Survey on Patient Safety Culture (HSOPSC)\textsuperscript{10-14,23}. The SAQ has 63 items divided into 6 subscales with a Chronbach’s alpha between .68 and .81\textsuperscript{9}. The HSOPSC has 42 items, 12 subscales with Chronbach’s alpha between .62 and .85\textsuperscript{15}.

Both of these tools are well designed and have large comparative databases for hospital data. The AHRQ tool is non-proprietary and therefore in most cases more economical to administer. The other 6 measurement tools also reported acceptable reliability ratings however are less widely utilized and do not have extensive nationwide comparative databases. These findings are consistent with a previous comprehensive review of patient safety culture surveys conducted by Colla et al.\textsuperscript{5}

Patient Outcomes Correlating to Culture of Safety

The choice of patient outcomes for the most part was driven by the level of analysis, hospital or nursing unit, and the type of nursing units included in the study. A summary of patient outcomes and significance of findings is available in Table 2.

If the analysis is at the hospital level then more global measures such as composite score for AHRQ patient safety indicators (PSI), mortality, and readmission rates have been found to
yield statistically significant results in the studies\textsuperscript{4,6,12,16}. In an additional study measuring outcomes at the overall hospital level of analysis patient safety culture and patient experience were significantly correlated\textsuperscript{13}.

When the analysis is at the nursing unit level those patient outcomes that are predominately nurse driven such as hospital acquired pressure ulcers (HAPU), family satisfaction and patient satisfaction, have been seen to yield statistically significant results\textsuperscript{7,10,11}. When studies are conducted in the intensive care setting the relationship between patient safety culture and patient mortality has also been a statistically significant finding\textsuperscript{8,9}. Prior research has been found that improved teamwork and communication among members of the care team has significantly correlated with decreased ICU patient mortality\textsuperscript{19}. A summary diagram linking tool selection with level of analysis and significant results is presented in Figure 1.

**Studies with Non-Significant or Unexpected Results**

Much can be learned from studies that found either non-significant or unexpected results. It is suspected that additional studies have been conducted that fall in this category but the researchers may not have sought publication. In total five studies were noted to fall in this category. Table 3 is a summary of the limitations of the studies that most likely contributed to the results.

There were two studies that reported unexpected significant results. The first reported that at the hospital level, the PSI nurse indicators (falls, HAPU, infection rates) increased as patient safety culture improved\textsuperscript{20}. This finding is most likely the result of the tool used to measure patient safety culture, the National Database of Nursing Quality Indicators Registered Nurse survey (NDNQI RN). The second reported that a more positive patient safety culture was
related to increases in medication errors\textsuperscript{21}. This finding could be related to willingness to report errors if the culture is supportive of patient advocacy.

**Analysis and Next Steps**

Overall the 17 studies conducted examining the relationship between patient safety culture and patient outcomes were well designed, used instruments with adequate psychometric properties and had large sample sizes. Many of the studies also examined nurse outcome variables with significant findings.

The patient outcomes that are least consistently reported to be significant are those considered nurse sensitive such as medication errors, HAPU, falls, and infections. Of the seven studies reporting nurse sensitive outcomes, two had findings that were opposite the hypothesis\textsuperscript{20,21} and three had non-significant findings\textsuperscript{6,14,23}. Evidence from these studies suggests that the number of adverse events is so small that variation in the dataset is inadequate to detect a significant correlation. In addition, use of medication errors as an outcome variable has the confounding effect of psychological safety and therefore has not been shown to be consistently effective.

If the researcher is studying patient safety culture at the hospital level, readmission rates, AHRQ composite rates, mortality and patient satisfaction were significantly correlated. When studying patient safety culture at the ICU level, mortality and family satisfaction had significant correlations. Finally, if the med/surg unit or mixed units is the level of analysis then patient satisfaction and HAPUs have been significantly correlated.

There are trends emerging related to connections between patient safety culture and specific patient outcomes. This information could guide researchers in study construction or administrators in validating the importance of a positive patient safety culture. The results that
yielded a significant relationship between patient safety culture and patient outcomes are outlined in Table 4.

The AHRQ HSOPSC and the SAQ are the two dominant tools used in these studies to measure patient safety culture. Given the credible psychometric characteristics and nationwide data bases associated with each tool, it guides the researcher in the direction of one of these tools versus the others that were used in the reviewed studies.

Now that these associations have been demonstrated the following next steps are recommended:

- Continue to refine the research connecting patient safety culture and patient outcomes both in conducting research using the current design (cross sectional) and through meta-analysis of the available studies to strengthen the connection between specific patient outcomes and patient safety culture.
- Conduct intervention research to determine the most effective means to improve patient safety culture and therefore improve patient outcomes.
- Conduct research that connects patient safety culture and other culturally sensitive variables, such as propensity for patient advocacy, to guide administrators to avenues for improving the culture of hospitals.

**Conclusion**

The research studies available have been conducted in the last 10 years demonstrating that the study of the relationship between patient safety culture and patient outcomes has occurred following the IOM report in 1998. There are multiple well designed cross-sectional studies to document the significance of the relationship however no intervention studies have been published to date. A foundation has been laid for interventional research which would
enhance the available research and provide direction for health care administrators as they continue to improve the patient safety culture of their organizations.

This review serves to assist future patient safety culture researchers in study design in the areas of tools, level of analysis and outcome selection. Research correlating these variables has been progressing over the last 10 years; however additional research is needed to understand the existing correlations and to determine interventions that improve the patient safety culture in hospitals.

Health care administrators today more than ever are being held accountable, financially and socially, for adverse events that occur within their health care organizations as well as the overall patient experience. The federal government and general public sentiment has changed from accepting human error as inevitable to challenging organizational leadership to improve health care systems that result in error and / or a negative patient experience. These changes have made understanding patient safety culture and its effect on patient outcomes imperative however, as seen in this review, there is work to be done concerning the study of patient safety culture and its connection to patient outcomes.
References


2. Leonard MW, Frankel AS. Role of effective teamwork and communication in delivering safe, high-quality care. *Mount Sinai School of Medicine* 2011;78:820-6.


<table>
<thead>
<tr>
<th>Reference</th>
<th>Sampling, response rate and setting</th>
<th>Design and level of analysis</th>
<th>Variables and (measurement tools)</th>
<th>Study findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dodek et al., 10</td>
<td>Sample: 2374 ICU staff members. 1381 family members of ICU patients. 54% and 64% response rates. Setting: 23 ICUs in Canada.</td>
<td>Design: Cross-sectional survey Level of analysis: Nursing unit</td>
<td>Safety culture (AHRQ HSOPSC) Family satisfaction with ICU (tool developed for a prior study)</td>
<td>Positive relationship between safety culture and family satisfaction of non-survivor patients who were in the ICU for &gt;= to 14 days (p=&lt;.01).</td>
</tr>
<tr>
<td>Sorra et al., 13</td>
<td>Sample: 73 hospital submitting data to the HCAPS and Hospital SOPS comparative data bases in 2008.</td>
<td>Design: Cross-sectional Level of analysis: Hospital</td>
<td>Safety culture (AHRQ HSOPSC) and patient satisfaction HCAPS.</td>
<td>Positive correlation between subscales of HSOPSC and nurse driven as well as composite HCAPS measures.</td>
</tr>
<tr>
<td>Chang &amp; Mark, 17</td>
<td>Sample: 4,954 RNs from medical-surgical units from 146 hospitals. Response rate of 75%.</td>
<td>Design: Cross-sectional descriptive Level of analysis: Nursing unit</td>
<td>Medication errors (incident reporting data) Learning climate (Error Orientation Scale)</td>
<td>Negative correlation between medication errors and perceived learning climate (p&lt;.01). A correlation between %RNs on unit and less medication errors when learning climate is poor (p&lt;.05). Six domains were identified post theme analysis. Three were related to patient safety culture, problem solving and learning, communication at</td>
</tr>
<tr>
<td>Curry et al., 22</td>
<td>Sample: 11 hospitals that ranked in either the top 5% or bottom 5% of performance for MI mortality rates.</td>
<td>Design: Qualitative, descriptive Level of analysis: Hospital</td>
<td>The selection criterion was mortality % of AMI patients within the first 30 days post event in CMS database.</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Sample</td>
<td>Design</td>
<td>Level of Analysis</td>
<td>Hospital Safety Climate (PSCHO). Readmission rates for heart failure, myocardial infarction and pneumonia (abstracted from Medicare data).</td>
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</tr>
<tr>
<td>Hanson, Williams, &amp; Singer et al.</td>
<td>Sample: 36,375 employees within 67 hospitals. A response rate of 38.5%.</td>
<td>Design: Cross-sectional Level of analysis: Hospital</td>
<td></td>
<td>A negative correlation between hospital safety climate and readmission rate for heart failure (p&lt;=.05). Front line staff members’ perception of patient safety climate are more highly correlated to readmission rates than senior leaders (p&lt;=.01).</td>
</tr>
<tr>
<td>Huang et al.</td>
<td>Sampling: 4,394 staff members from a convenience sample of 30 ICUs. 47.9% response rate.</td>
<td>Design: Cross-sectional Level of analysis: Nursing unit.</td>
<td>Safety culture (SAQ-ICU version). ICU LOS and patient mortality (multisite clinical database).</td>
<td>A negative correlation between perception of management and patient mortality (p=.02). A negative correlation between safety climate and LOS (p=.03).</td>
</tr>
<tr>
<td>Mardon et al.</td>
<td>Sampling: 56,480 staff members from a convenience sample of 179 hospitals in the AHRQ’s database. Sampling: 21,730 nurses, 1,010,298 patients (mortality, LOS), 3,473,127 patients (HAPU, post op PE/VTE) from 688 hospitals</td>
<td>Design: Cross-sectional descriptive Level of analysis: Hospital</td>
<td>Hospital safety culture (AHRQ HSOPSC). Patient safety (8 measures from the AHRQ’s PSIs in total).</td>
<td>The HSOPSC composite score was negatively correlated with composite PSI scores (p&lt;.001). Safety grade and positive safety score was negatively correlated to mortality (p&lt;.01).</td>
</tr>
<tr>
<td>Olds</td>
<td></td>
<td>Design: Cross-sectional Level of analysis: Hospital</td>
<td>Hospital safety culture (AHRQ HSOPSC). Patient outcomes (State level data base reported at the hospital level)</td>
<td></td>
</tr>
<tr>
<td>Thompson(^{14}) Dissertation</td>
<td>Sampling: Convenience sample of 34 unit directors and their 711 staff members in a large academic medical center. Response rate was 90% Design: Descriptive, multi-level cross-sectional Level of analysis: Nursing unit.</td>
<td>Hospital safety culture (AHRO HSOPSC). Patient outcomes, CAUTI, CLABSI, SSI, HAPU, falls and failure to rescue (hospital data collection systems).</td>
<td>No significant relationship between patient safety culture and patient outcomes.</td>
<td></td>
</tr>
<tr>
<td>Kemper(^{20}) Dissertation</td>
<td>Sampling: A convenience sample of 97 hospitals that participated in the NDNQI RN survey in 2005. Design: Cross-sectional Level of analysis: Hospital</td>
<td>Culture of safety (NDNQI RN survey subscales classified into organizational support (OS) and work unit support (WS)). Patient outcomes (PSI rates, HAPU, failure to rescue, HAI, VTE rates)</td>
<td>An unexpected positive correlation was noted between Organizational support (OS) and PSI (p=.03).</td>
<td></td>
</tr>
<tr>
<td>Obrien(^{6}) Dissertation</td>
<td>Sampling: 6,697 healthcare staff members from a convenience sample of 59 units in 10 community hospitals. Design: Cross-sectional, descriptive, model testing Level of analysis: Hospital and unit</td>
<td>Patient safety culture (SAQ), fall and HAPU rates (NDNQI database) Hospital failure rate (CMS sponsored data collection-including community acquired pneumonia CAP)</td>
<td>No significant relationship between patient safety climate and falls or HAPUs. A negative relationship was noted between staff perception of support of manager and failure rate for the CAP performance measure. Positive correlations were found on several subscales of the HSOPSC with 5/6 measures on the HCAPHS (p&lt;.001).</td>
<td></td>
</tr>
<tr>
<td>Gearhart(^{11}) Dissertation</td>
<td>Sampling: 287 nursing staff and 216 patients on three hospital units in three San Francisco Bay hospitals. Design: Cross-sectional, descriptive, correlational Level of analysis: Nursing unit</td>
<td>Patient safety culture (HSOPSC) Patient experience (Consumers Assessment of Healthcare Providers and Systems-Hospital version HCAPHS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Study Design and Methods</td>
<td>Results</td>
<td></td>
<td></td>
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<tr>
<td>-------------------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Mark et al. 21</td>
<td>Sampling: Random sample of 278 nursing units in 143 hospitals. 4911 RNs (response rate 75% and 2720 patients.</td>
<td>Safety climate (Error Orientation Scale &amp; Zohar Safety Climate Scale) Organizational effectiveness (medication error rates and falls) A positive correlation was found between medication error rate and safety climate with the interaction effect higher %RN with BSN and RNs with BSNs (p=.01). A positive correlation between %RN and RNs with BSNs and falls at high levels of safety climate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taylor 7</td>
<td>Sampling: A convenience sample of nurses working on 29 units (with &gt;60% response rate to the SAQ in one large academic medical center and 28,260 discharged patients data.</td>
<td>Organizational Culture (SAQ) Patient outcomes, falls and medication errors (occurrence reporting system), PE/DVT and HAPU (hospital discharge data) One subscale of the SAQ, increasing stress recognition was positively correlated to patient falls (p=.000). Safety climate subscale was negatively correlated to HAPU (p=.000).</td>
<td></td>
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</tr>
<tr>
<td>Singer et al. 4</td>
<td>Sampling: Convenience sample of 42 hospitals that participated in both the AHRQ’s data base in 2002 and the PSCHO survey in 2004.</td>
<td>Hospital safety culture (PSCHO) Patient outcomes (14 PSIs from AHRQ data base combined into 3 groups, post-op complications, nurse sensitive, technical difficulty with procedures.) Fear of blame was positively correlated to performance on all PSI’s, post-op complications (p&lt;.01) and nurse sensitive outcomes (p&lt;.05). Fear of shame positively correlated to technical difficulty (p&lt;.05).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hofmann &amp; Mark 18</td>
<td>Sampling: 42 randomly selected hospitals. Use Design: Cross-sectional Level of analysis: Hospital</td>
<td>Perception of safety climate (Zohar’s) Safety climate was negatively correlated to</td>
<td></td>
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</tr>
</tbody>
</table>
| Sexton\(^9\)  | Sampling: A convenience sample of 118 ICUs in the United Kingdom enrolled in a prior study that collected APACHE II data. 45% met inclusion criteria (18,089 ICU patients). 5,540 healthcare professionals at 68% participation. | Design: Cross-sectional Level of analysis: Nursing unit | Risk adjusted mortality (APACHE II data base)  
Staff perception of safety climate (SAQ revised by researcher to be ICU specific). | Two subscales of the SAQ, safety climate (p=<.005) and perception of management (p=<.006) were negatively correlated to risk-adjusted ICU mortality. The same findings were noted in the RN only analysis of data. |
<table>
<thead>
<tr>
<th>Patient Outcome</th>
<th>Source</th>
<th>Study Findings</th>
<th>Level of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Satisfaction</td>
<td>Dodek et al.</td>
<td>X</td>
<td>Nursing Unit ICU</td>
</tr>
<tr>
<td>Patient satisfaction</td>
<td>Gearhart</td>
<td>X</td>
<td>Nursing Unit med/surg</td>
</tr>
<tr>
<td></td>
<td>Hofmann &amp; Mark</td>
<td>X</td>
<td>Nursing Unit med/surg</td>
</tr>
<tr>
<td>Medication Errors</td>
<td>Sorra et al.</td>
<td>X</td>
<td>Hospital</td>
</tr>
<tr>
<td></td>
<td>Chang &amp; Mark</td>
<td>X</td>
<td>Nursing Unit med/surg</td>
</tr>
<tr>
<td></td>
<td>Mark et al.</td>
<td>X</td>
<td>Nursing Unit med/surg</td>
</tr>
<tr>
<td></td>
<td>Taylor</td>
<td>X</td>
<td>Nursing Unit med/surg</td>
</tr>
<tr>
<td></td>
<td>Hofmann &amp; Mark</td>
<td>X</td>
<td>Nursing Unit med/surg</td>
</tr>
<tr>
<td>Mortality</td>
<td>Huang et al.</td>
<td>X</td>
<td>Nursing Unit ICU</td>
</tr>
<tr>
<td></td>
<td>Sexton</td>
<td>X</td>
<td>Nursing Unit ICU</td>
</tr>
<tr>
<td></td>
<td>Olds</td>
<td>X</td>
<td>Hospital</td>
</tr>
<tr>
<td>Readmission</td>
<td>Hanson, Williams &amp; Singer</td>
<td>X</td>
<td>Hospital</td>
</tr>
<tr>
<td>PSI composite*</td>
<td>Mardon et al.</td>
<td>X</td>
<td>Hospital</td>
</tr>
<tr>
<td></td>
<td>Singer et al.</td>
<td>X</td>
<td>Hospital</td>
</tr>
<tr>
<td>PSI nurse** Sensitive</td>
<td>Thompson</td>
<td>X</td>
<td>Nursing Unit mixed</td>
</tr>
<tr>
<td></td>
<td>Kemper</td>
<td>X</td>
<td>Hospital</td>
</tr>
<tr>
<td></td>
<td>Obrien</td>
<td>X</td>
<td>Nursing Unit mixed</td>
</tr>
<tr>
<td></td>
<td>Mark et al.</td>
<td>X</td>
<td>Nursing Unit med/surg</td>
</tr>
<tr>
<td></td>
<td>Taylor</td>
<td>X</td>
<td>Nursing Unit mixed</td>
</tr>
<tr>
<td></td>
<td>Hofmann &amp; Mark</td>
<td>X</td>
<td>Nursing Unit med/surg</td>
</tr>
<tr>
<td>Failure rate AMI/ HF</td>
<td>Olds</td>
<td>X</td>
<td>Hospital</td>
</tr>
<tr>
<td></td>
<td>Obrien</td>
<td>X</td>
<td>Hospital</td>
</tr>
</tbody>
</table>

Table 3 Non-significant / unexpected results relating patient safety culture to outcomes
<table>
<thead>
<tr>
<th>Source</th>
<th>Study Findings Non Significant/ Unexpected</th>
<th>Level of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obrien(^6)</td>
<td>AMI / HF at the hospital level non-significant</td>
<td>Post hoc power analysis indicated insufficient number of hospitals</td>
</tr>
<tr>
<td></td>
<td>HAPU / Falls at unit level non-significant</td>
<td>Data was nurse reported with few events reported leading to a heavily skewed distribution</td>
</tr>
<tr>
<td>Thompson(^14)</td>
<td>PSI Nurse Sensitive non-significant</td>
<td>Low reported number of adverse events per unit leading to a negatively skewed distribution of patient outcome variables</td>
</tr>
<tr>
<td>Kemper(^20)</td>
<td>PSI Nurse Sensitive / unexpected result</td>
<td>The measurement tool chosen for culture of safety was an RN satisfaction survey with no demonstrated validity to measure culture of safety.</td>
</tr>
<tr>
<td>Mark et al.(^21)</td>
<td>Medication errors / unexpected result</td>
<td>Positive patient safety culture was found to increase medication errors potentially due to the perception of psychological safety.</td>
</tr>
<tr>
<td>Olds(^23)</td>
<td>Falls / HAPU (AHRQ-PSI) non-significant</td>
<td>The AHRQ PSI data is abstracted from closed medical records. The methodology removes reporting bias however results in small numbers of events and skewed data distribution. Nursing Unit Hospital</td>
</tr>
</tbody>
</table>
Table 4 *Summary of significant study outcomes: relationship between safety culture and patient outcomes*

<table>
<thead>
<tr>
<th>Culture tool</th>
<th>Source</th>
<th>Patient Outcome</th>
<th>Significant Studies</th>
<th>Level of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHRQ HSOPSC</td>
<td>Dodek et al. 10</td>
<td>Family Satisfaction Patient experience</td>
<td>Positive Correlation Positive Correlation</td>
<td>Nursing Unit ICU Hospital</td>
</tr>
<tr>
<td></td>
<td>Sorra et al. 13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mardon et al. 12</td>
<td>AHRQ PSIs (composite)</td>
<td>Negative Correlation</td>
<td>Hospital</td>
</tr>
<tr>
<td></td>
<td>Gearhart 11</td>
<td>Patient experience Mortality</td>
<td>Positive Correlation Negative Correlation</td>
<td>Nursing Unit</td>
</tr>
<tr>
<td></td>
<td>Olds 23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error Orientation Scale PSCHO</td>
<td>Chang &amp; Mark 17</td>
<td>Medication errors Readmission</td>
<td>Negative Correlation Negative Correlation</td>
<td>Nursing Unit</td>
</tr>
<tr>
<td></td>
<td>Hanson, Williams, &amp; Singer 16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Singer et al. 4</td>
<td>AHRQ PSIs (composite)</td>
<td>Positive Correlation</td>
<td>Hospital</td>
</tr>
<tr>
<td>NDNQI RN Survey SAQ ICU</td>
<td>Kemper 20</td>
<td>PSI nurse indicators</td>
<td>Unexpected Positive</td>
<td>Hospital</td>
</tr>
<tr>
<td></td>
<td>Huang et al. 8</td>
<td>Patient mortality</td>
<td>Negative Correlation</td>
<td>Nursing Unit ICU</td>
</tr>
<tr>
<td></td>
<td>Sexton 9</td>
<td>Patient mortality</td>
<td>Negative Correlation</td>
<td>Nursing Unit ICU</td>
</tr>
<tr>
<td>SAQ Hospital</td>
<td>Obrien 6</td>
<td>Community acquired pneumonia HAPU</td>
<td>Negative Correlation</td>
<td>Nursing Unit Mixed</td>
</tr>
<tr>
<td></td>
<td>Taylor 7</td>
<td>Patient mortality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zohar Safety Climate Scale</td>
<td>Mark et al. 21</td>
<td>Medication Errors</td>
<td>Unexpected Positive</td>
<td>Nursing Unit Med/surg</td>
</tr>
<tr>
<td></td>
<td>Hofmann &amp; Mark 18</td>
<td>Medication Errors &amp; UTI Patient satisfaction</td>
<td>Negative Correlation Positive Correlation</td>
<td>Nursing Unit Med/surg</td>
</tr>
</tbody>
</table>
Hospital Survey on Patient Safety

Instructions

This survey asks for your opinions about patient safety issues, medical error, and event reporting in your hospital and will take about 10 to 15 minutes to complete.

If you do not wish to answer a question, or if a question does not apply to you, you may leave your answer blank.

An “event” is defined as any type of error, mistake, incident, accident, or deviation, regardless of whether or not it results in patient harm.

“Patient safety” is defined as the avoidance and prevention of patient injuries or adverse events resulting from the processes of health care delivery.

SECTION A: Your Work Area/Unit

In this survey, think of your “unit” as the work area, department, or clinical area of the hospital where you spend most of your work time or provide most of your clinical services.

What is your primary work area or unit in this hospital? Select ONE answer.

☐ a. Many different hospital units/No specific unit

☐ b. Medicine (non-surgical)

☐ c. Surgery

☐ d. Obstetrics

☐ e. Pediatrics

☐ f. Emergency department

☐ g. Intensive care unit (any type)

☐ h. Psychiatry/mental health

☐ i. Rehabilitation

☐ j. Pharmacy

☐ k. Laboratory

☐ l. Radiology

☐ m. Anesthesiology

☐ n. Other, please specify:
Please indicate your agreement or disagreement with the following statements about your work area/unit.

Think about your hospital work area/unit…

1. People support one another in this unit ..............................
   □ 1 □ 2 □ 3 □ 4 □ 5

2. We have enough staff to handle the workload......................
   □ 1 □ 2 □ 3 □ 4 □ 5

3. When a lot of work needs to be done quickly, we work together as a team to get the work done .......................  □ 1 □ 2 □ 3 □ 4 □ 5

4. In this unit, people treat each other with respect ..............  □ 1 □ 2 □ 3 □ 4 □ 5

5. Staff in this unit work longer hours than is best for patient care ................................................................. □ 1 □ 2 □ 3 □ 4 □ 5

SECTION A: Your Work Area/Unit (continued)

Think about your hospital work area/unit…

6. We are actively doing things to improve patient safety ........
   □ 1 □ 2 □ 3 □ 4 □ 5

7. We use more agency/temporary staff than is best for patient care ................................................................. □ 1 □ 2 □ 3 □ 4 □ 5

8. Staff feel like their mistakes are held against them ..........  □ 1 □ 2 □ 3 □ 4 □ 5

9. Mistakes have led to positive changes here.....................  □ 1 □ 2 □ 3 □ 4 □ 5

10. It is just by chance that more serious mistakes don’t happen around here.......................................................... □ 1 □ 2 □ 3 □ 4 □ 5

11. When one area in this unit gets really busy, others help out .... □ 1 □ 2 □ 3 □ 4 □ 5

12. When an event is reported, it feels like the person is being written up, not the problem ........................................... □ 1 □ 2 □ 3 □ 4 □ 5

13. After we make changes to improve patient safety, we evaluate their effectiveness ............................................. □ 1 □ 2 □ 3 □ 4 □ 5

14. We work in “crisis mode” trying to do too much, too quickly .... □ 1 □ 2 □ 3 □ 4 □ 5

15. Patient safety is never sacrificed to get more work done ....... □ 1 □ 2 □ 3 □ 4 □ 5

16. Staff worry that mistakes they make are kept in their personnel file................................................................. □ 1 □ 2 □ 3 □ 4 □ 5
17. We have patient safety problems in this unit ..............................................................

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

SECTION B: Your Supervisor/Manager

Please indicate your agreement or disagreement with the following statements about your immediate supervisor/manager or person to whom you directly report.

1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures .......................................................... 
2. My supervisor/manager seriously considers staff suggestions for improving patient safety .........................
3. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts ..... 
4. My supervisor/manager overlooks patient safety problems that happen over and over .............................................................

SECTION C: Communications

How often do the following things happen in your work area/unit?

Think about your hospital work area/unit...

1. We are given feedback about changes put into place based on event reports ...........................................................
2. Staff will freely speak up if they see something that may negatively affect patient care .................................
3. We are informed about errors that happen in this unit .......... 
4. Staff feel free to question the decisions or actions of those with more authority ..........................................................
5. In this unit, we discuss ways to prevent errors from happening again ..........................................................
6. Staff are afraid to ask questions when something does not seem right ..........................................................

SECTION D: Frequency of Events Reported

In your hospital work area/unit, when the following mistakes happen, how often are they reported?
1. When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported? 

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Most of the time</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2. When a mistake is made, but has no potential to harm the patient, how often is this reported? 

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Most of the time</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3. When a mistake is made that could harm the patient, but does not, how often is this reported? 

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Most of the time</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
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<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

SECTION E: Patient Safety Grade

Please give your work area/unit in this hospital an overall grade on patient safety.

- A: Excellent
- B: Very Good
- C: Acceptable
- D: Poor
- E: Failing

SECTION F: Your Hospital

Please indicate your agreement or disagreement with the following statements about your hospital.

Think about your hospital...

1. Hospital management provides a work climate that promotes patient safety.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2. Hospital units do not coordinate well with each other.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3. Things “fall between the cracks” when transferring patients from one unit to another.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
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</tbody>
</table>

4. There is good cooperation among hospital units that need to work together.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
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<td>4</td>
<td>5</td>
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</tbody>
</table>

SECTION F: Your Hospital (continued)

Think about your hospital...

5. Important patient care information is often lost during shift changes.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

6. It is often unpleasant to work with staff from other hospital units.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

7. Problems often occur in the exchange of information across hospital units.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
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<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

8. The actions of hospital management show that patient safety is a top priority.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
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<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

9. Hospital management seems interested in patient safety.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither</th>
<th>Agree</th>
<th>Strongly Agree</th>
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<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
only after an adverse event happens

10. Hospital units work well together to provide the best care for patients

11. Shift changes are problematic for patients in this hospital

SECTION G: Number of Events Reported

In the past 12 months, how many event reports have you filled out and submitted?

- a. No event reports
- b. 1 to 2 event reports
- c. 3 to 5 event reports
- d. 6 to 10 event reports
- e. 11 to 20 event reports
- f. 21 event reports or more

SECTION H: Background Information

This information will help in the analysis of the survey results.

1. How long have you worked in this hospital?

- a. Less than 1 year
- b. 1 to 5 years
- c. 6 to 10 years
- d. 11 to 15 years
- e. 16 to 20 years
- f. 21 years or more

2. How long have you worked in your current hospital work area/unit?

- a. Less than 1 year
- b. 1 to 5 years
- c. 6 to 10 years
- d. 11 to 15 years
- e. 16 to 20 years
- f. 21 years or more

3. Typically, how many hours per week do you work in this hospital?

- a. Less than 20 hours per week
- b. 20 to 39 hours per week
- c. 40 to 59 hours per week
- d. 60 to 79 hours per week
- e. 80 to 99 hours per week
- f. 100 hours per week or more

SECTION H: Background Information (continued)

4. What is your staff position in this hospital? Select ONE answer that best describes your staff position.

- a. Registered Nurse
- b. Physician Assistant/Nurse Practitioner
- c. LVN/LPN
- j. Respiratory Therapist
- k. Physical, Occupational, or Speech Therapist
- l. Technician (e.g., EKG, Lab, Radiology)
☐ d. Patient Care Asst/Hospital Aide/Care Partner ☐ m. Administration/Management
☐ e. Attending/Staff Physician ☐ n. Other, please specify:
☐ f. Resident Physician/Physician in Training
☐ g. Pharmacist
☐ h. Dietician
☐ i. Unit Assistant/Clerk/Secretary

5. In your staff position, do you typically have direct interaction or contact with patients?
   ☐ a. YES, I typically have direct interaction or contact with patients.
   ☐ b. NO, I typically do NOT have direct interaction or contact with patients.

6. How long have you worked in your current specialty or profession?
   ☐ a. Less than 1 year ☐ d. 11 to 15 years
   ☐ b. 1 to 5 years ☐ e. 16 to 20 years
   ☐ c. 6 to 10 years ☐ f. 21 years or more

SECTION I: Your Comments
Please feel free to write any comments about patient safety, error, or event reporting in your hospital.

THANK YOU FOR COMPLETING THIS SURVEY.
Permission was obtained for use of this scale in this research however permission was not granted for publication of the scale. The demographic questions added to the scale are noted below.

1. **How long have you worked in this hospital?**
   - □ a. Less than 1 year
   - □ b. 1 to 5 years
   - □ c. 6 to 10 years
   - □ d. 11 to 15 years
   - □ e. 16 to 20 years
   - □ f. 21 years or more

2. **How long have you worked in your current hospital work area/unit?**
   - □ a. Less than 1 year
   - □ b. 1 to 5 years
   - □ c. 6 to 10 years
   - □ d. 11 to 15 years
   - □ e. 16 to 20 years
   - □ f. 21 years or more

20. **How long have you practiced as registered nurse?**
   - □ a. Less than 1 year
   - □ b. 1 to 5 years
   - □ c. 6 to 10 years
   - □ d. 11 to 15 years
   - □ e. 16 to 20 years
   - □ f. 21 years or more

21. **What is your highest level of nursing education?**
   - □ a. Diploma
   - □ b. Associate Degree
   - □ c. Baccalaureate Degree
   - □ d. Masters Degree
   - □ e. PhD / DNP / other nursing doctorate

22. **What is your age?**
   - □ a. 20 years old or younger
   - □ b. 21-30
   - □ c. 31-40
   - □ d. 41-50
   - □ e. 51-60
   - □ f. 61 or older
22. What is your gender?
   □ a. Male
   □ b. Female
Appendix C: HCAHPS Survey Nurse Sensitive Questions

www.hcahpsonline.org/globalassets/hcahps/survey-instruments

Communication with Nurses:

1. During this hospital stay, how often did nurses treat you with courtesy and respect?
   - □ Never  □ Sometimes  □ Usually  □ Always

2. During this hospital stay, how often did nurses listen carefully to you?
   - □ Never  □ Sometimes  □ Usually  □ Always

3. During this hospital stay, how often did nurses explain things in a way you could understand?
   - □ Never  □ Sometimes  □ Usually  □ Always

Responsiveness of Hospital Staff:

4. During this hospital stay, after you pressed the call button, how often did you get help as soon as you wanted it?
   - □ Never  □ Sometimes  □ Usually  □ Always

5. How often did you get help with getting to the bathroom or using a bedpan as soon as you wanted?
   - □ Never  □ Sometimes  □ Usually  □ Always

Pain Management:

6. During this hospital stay, how often was your pain well controlled?
   - □ Never  □ Sometimes  □ Usually  □ Always

7. During this hospital stay, how often did the hospital staff do everything they could to help you with your pain?
   - □ Never  □ Sometimes  □ Usually  □ Always
Appendix D: Letter of Support from Regional Vice President Operations Allegheny Health Network

April 11, 2016

Dear Sir or Madam:

I am writing this letter to share my support for the study proposed by Margare (Margie) DiCicco RN, MSN, entitled determining the relationship between patient safety culture and nurse sensitive patient outcomes when considering the nurse’s attitude toward patient advocacy. We have discussed the use of presenting Allegheny Health Network (AHN) hospital data from the 2015 Culture of Patient Safety Survey conducted at the 7 AHN hospitals as well as unit level patient outcome information, including patient experience, hospital acquired pressure ulcers and patient fall data reported during 2015. I am supportive of her use of this de-identified data for the purposes of conducting this study conditional to IRB approval at both the AHN IRB and the Duquesne University IRB.

Margie has served as the Chief Nursing Officer (CNO) for Allegheny General Hospital for the last 20 months and the (CNO) collaborative leader for the last 8 months. During her tenure with AHN she has conducted her administrative roles with honesty and integrity. Margie is a well-regarded leader in the region and has extensive knowledge and background in the investigation and implementation of a patient safety culture. I feel strongly that she has the background and commitment necessary to conduct ethical and high quality research at AHN.

We are pleased to be able to provide the clinical facilities necessary for her research and look forward to the results of her study. Please feel free to contact me should you need additional information.

Sincerely,

David Goldberg
Regional Vice President, Operations
Allegheny Health Network
Isabella St.
Pittsburgh, PA 15212
Appendix E: Institutional Review Board Approvals Duquesne University

**Institutional Review Board**

**Duquesne University IRB**

**Protocol Exemption Notification**

To: Margaret Dicuccio  
From: Linda Goodfellow, IRB Chair  
Subject: Protocol #2016/05/8  
Date: 06/16/2016

The protocol **2016/05/8. Determining the relationship between perceptions of patient safety culture, nurses’ attitudes toward patient advocacy, and nurse sensitive patient outcomes.** has been verified by the Institutional Review Board as **Exempt** according to 45CFR46.101(b)(4): Existing Data & Specimens - No Identifiers on 06/16/2016.

If you propose any changes in your procedure or consent process, you must complete an amendment form of those changes and submit it to the IRB Chair for approval. Please wait for the approval before implementing any changes to the original protocol. In addition, if any unanticipated problems or adverse effects on subjects are discovered, you must immediately report them to the IRB Chair before proceeding with the study.

Because the study is exempt and there is no specific expiration date, you will not receive a continual renewal notification nor will you need to complete an annual report. However, when the study is complete, you must terminate the study by completing the Exempt Study Termination Form that can be found under IRB Documentation. Please upload the completed form to your protocol page via Mentor. Keep a copy of your research records, other than those you have agreed to destroy for confidentiality, over a period of five years after the study's completion.

Please note that changes to your protocol may affect its exempt status. Please contact me directly to discuss any changes you may contemplate.

Thank you for contributing to Duquesne's research endeavors,

Linda Goodfellow, PhD, RN, FAAN  
IRB Chair  
goodfellow@duq.edu
To: Margaret Dicuccio
From: David Delmonico, IRB Chair
Subject: Protocol #2016/05/8
Date: 10/24/2016

The amendment to protocol Determining the relationship between perceptions of patient safety culture, nurses' attitudes toward patient advocacy, and nurse sensitive patient outcomes. has been approved by the Chair of the IRB on 10/24/2016.

The research remains subject to all stipulations put forth in this IRB’s original approval notification and annual review remains on the cycle determined by the original approval.

The amended consent form, if applicable, is attached, stamped with current approval date but original expiration date. You should use the amended stamped form as original for copies that are distributed or displayed.

If you have any questions, feel free to contact me.

David Delmonico, Ph.D.
Institutional Review Board, Chair
irb@duq.edu
November 14, 2016

Margaret DiCuccio, RN
Chief Operating and Nursing Officer
Department of Nursing Administration

Re: “Determining the Relationship between Patient Safety Culture and Nurse Sensitive Patient Outcomes when Considering the Nurse’s Attitude toward Patient Advocacy”

Dear Ms. DiCuccio:

The ASRI-WPAHS Institutional Review Board (IRB) has reviewed your revised submission received November 13, 2016, pertaining to the above referenced protocol.

The IRB has reviewed this new information and finds that this protocol does not fall under the purview of the IRB as it does not meet the definition of human subjects research according to the federal code of regulations: 45 CFR 46.102(f). You have indicated that the purpose of this program is to determine the relationship between and among perceptions of patient safety culture, nurses’ attitudes toward patient advocacy and nurse sensitive patient outcomes.

If the project should be revised at any time, for any reason, please provide a copy of the updated information to the IRB for reassessment.

Sincerely,

[Signature]

Peter Ledwich, MBA
Manager
Institutional Review Board

PL/gh
Appendix H: Journal of Patient Safety Editor Approval

From: Martin, Druanne <Druanne.Martin@wolterskluwer.com>
Sent: Monday, July 10, 2017 12:50 PM
To: Margaret Dicuccio
Subject: RE: Use of an article in a ETD document

Dear Dr. DiCuccio,

Thank you for publishing in *Journal of Patient Safety*.

Per the Copyright Transfer Form for the journal:

Journal of Patient Safety will permit the author(s) to deposit for display a "final peer-reviewed manuscript" (the final manuscript after peer-review and acceptance for publication but prior to the publisher's copyediting, design, formatting, and other services) 12 months after publication of the final article on his/her personal web site, university's institutional repository or employer's intranet, subject to the following:

* You may only deposit the final peer-reviewed manuscript.
* You may not update the final peer-reviewed manuscript text or replace it with a proof or with the final published version.
* You may not include the final peer-reviewed manuscript or any other version of the article in any commercial site or in any repository owned or operated by any third party. For authors of articles based on research funded by NIH, Welcome Trust, HHMI, or other funding agency, see below for the services that LWW will provide on your behalf to comply with "Public Access Policy" guidelines.
* You may not display the final peer-reviewed manuscript until twelve months after publication of the final article.
* You must attach the following notice to the final peer-reviewed manuscript:
  "This is a non-final version of an article published in final form in (provide complete journal citation)".
* You shall provide a link in the final peer-reviewed manuscript to the Journal of Patient Safety website.

If you have any additional questions, please let me know.

Regards,

Druanne

Druanne Martin  
Senior Publisher