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Nurses' Perception of Their Role in Patient Safety

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This is to certify that the doctoral dissertation by

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Walden University
2018

Abstract

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MSN, University of Phoenix, 2006

BSN, Washington Adventist University, 2002

Dissertation Submitted in Partial Fulfillment

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Abstract

Despite efforts to ensure patient safety in the United States, patients are being harmed by preventable errors. There is a gap in the literature from the nurse's perspective as to why medical errors continue to occur despite having evidence-based safety strategies available. The purpose of this constructivist grounded theory study was to develop a theory explaining nurses' perception of their role in patient safety and why medical errors are still occurring despite implementation of evidence-based safety strategies. The systems engineering initiative for patient safety (SEIPS) model provided the conceptual framework for the study. Data collection included interviews with 11 nurses who worked in a Magnet designated hospital. Data were sorted and analyzed using the constant comparative method. Three themes emerged: technology, work environment, and human factors. These themes aligned with components of the SEIPS model. An emphasis on how technology adds to the nurses' workload compounded with a busy work environment was noted as a contributing factor for bypassing safety systems. The bypass model theory was derived from the themes to describe the conditions that nurses work in that result in bypassing safety systems. Further research needs to go beyond engaging nurses with the implementation of health IT system by examining long-term impacts on workflow as changes are being made. Addressing the reasons why safety measures are bypassed can affect positive social change which will improve the quality and safety of patient care outcomes.

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Dedication

This dissertation is dedicated to my biggest cheerleader, my mom Barbara Walker. She has truly been an inspiration throughout my academic career. I am grateful for her patience, wisdom, and support. I would also like to thank my brothers, David and Marcus, for always being supportive of me. This has truly been an experience I will never forget.

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Chapter 1: Introduction to the Study

Since the Institute of Medicine's (IOM) report released in 1999 *To Err Is Human: Building a Safer Health System*, patient safety and quality have been part of the national health care discussion (Ulrich & Kear, 2014). The Institute for Healthcare Improvement estimated that 40,000 errors occur daily that harm patients, with an average of 15 million mistakes taking place annually in the hospital setting (IOM, 2000). In response to the 1999 IOM report, health care organizations began to implement practices to reduce preventable harm to patients (Weingarten, 2013). In the IOM follow-up report, *Crossing the Quality Chasm*, the committee found only marginal improvements in patient safety efforts (IOM, 2001). A recent report by the Leapfrog Group (2015) highlighted that 1,000 people are dying every day from preventable errors. Makary and Daniel (2016) reported that medical errors are the third leading cause of death in the United States after heart disease and cancer. Although patient safety has been a central focus in practice and health care research in the past two decades, preventable medical errors continue to be a documented problem (Banihashemi et al., 2015; Groves & Semes, 2012).

Byrnes (2015) viewed patient safety as being in a state of crisis because of the continued occurrence of patient harm events. Even though patient safety initiatives have been implemented in many health care organizations, patients continue to be harmed at an alarming rate from medical errors, which can result in death or a debilitating injury (James, 2013; Makary & Daniel, 2016; Pronovost et al., 2009). Despite these grave consequences, medical errors are still occurring, and most of these mistakes are found to be preventable (Banihashemi et al., 2015).

Nurses have a major influence on the quality of patient care and patient safety (Mwachofi, Walston, & Al-Omar, 2011). Kowalski and Anthony (2017) found that nurses' role in patient safety has evolved over the years, and safety has consistently remained a primary goal of nursing. Kowalski and Anthony surmised that nurses' role in patient safety centers on three topics: infection control, medication safety, and response to new technology. Smeulers, Onderwater, Zwieten, and Vermeulen (2014) posed that nurses have the closest interaction with patients, which enables them to assess and monitor the conditions of their patients and to use clinical reasoning to coordinate the delivery of safe care. Nurses play a pivotal role in facilitating quality and safe care as they are in a critical position to recognize, intercept, and correct errors before they reach patients (Henneman, Gawlinski, & Giuliano, 2012). There is mounting evidence that the role nurses play in safety is dependent on their knowledge and ability to clinically reason (Smeulers et al., 2014). For example, the physician may write an order to administer a drug, but the nurse might hold the medication because of patient status.

The American Nurses Association's (ANA, 2010) social policy statement describes the fundamental nature and role of professional nursing in society and health care. Nurses focus their knowledge, skills, and caring on improving the health of the public by ensuring safe and efficient quality care (ANA, 2010). Safe and quality care is a basic expectation of patients. Understanding nurses' perception of their role in patient safety and reasons why errors are still occurring despite evidence-based safety strategies is part of nurses' social contract with society. The primary social change implication from this study was to improve the quality and safety of patient care. Advancing understanding

of nurses' perceptions of their roles in preventing errors and why errors are still occurring may inform the understanding of errors, which may lead to a reduction of medical errors.

In this chapter, I summarize the research literature related to patient safety and the role of the nurse in keeping patients safe. I review evidence that supports the need for this study, the significance of the research problem to the nursing profession, and the meaningful gaps in the literature this study addressed. I include the purpose of the study, research questions, conceptual framework, and research methods. I also define key terms, identify critical assumptions, and address the scope and limitations of the study.

Background

Patient safety can be defined as "the prevention of harm to patients" (Aspden, Corrigan, Wolcott, & Erickson, 2004, p. 5). Patient safety has had a global impact on health care (Banihashemi et al., 2015; Chassin, 2013). Patients are susceptible to experiencing medical errors that are a threat to patient safety (La Pietra, Calligaris, Molendini, Quattrin & Brusaferro, 2005). Leape, Lawthers, Brenna, and Johnson (1993) identified four categories associated with medical errors: diagnostic, treatment, preventative, and other, including communication, equipment, and other system failures. Leape et al. (1993) found that errors associated with diagnostics included the delay in diagnosis or a failure to act on results, while medical errors found in the preventative category included failures to monitor or conduct follow-up treatment.

Researchers have found that many factors contribute to medical errors, which may lead to adverse patient events. The Institute for Healthcare Improvement (as cited in IOM, 2000) used a similar definition: "unintended physical injury resulting from or

contributed to by medical care (including the absence of indicated medical treatment), that requires additional monitoring, treatment, or hospitalization, or that results in death" (p. 2). Adverse events can be described as unintentional harm caused to a patient (Zegers et al., 2009). According to the Agency for Healthcare Research and Quality (2017), preventable adverse events can occur when the standards of care have not been met. Preventable medical errors have led to serious safety events resulting in the deaths of patients (Banihashemi et al., 2015).

The role of the professional nurse has evolved. Nurses have needed to navigate barriers that have impacted safe care practices, such as inadequate staffing ratios, poor communication, and long working hours (Kowalski & Anthony, 2017). Factors such as poor communication, lack of nursing advocacy, and lack of teamwork have been noted as areas that have compromised patient safety (Choi, Cheung, & Pang, 2014; Ulrich & Kear, 2014). Shekelle (2013) noted evidence suggesting a relationship between staffing ratios and mortality and that further research should be done to examine what nurses do in their role to safeguard patients. Mitchell (2008) highlighted how nurses' role in monitoring and surveillance contribute to patient safety. Hughes and Clancy (2009) suggested that the role of the nurse in patient safety has been narrowly studied and has focused on a few areas such as errors in medication administration and falls. The causes of medication errors from the perspective of the nurse have been linked to fatigue, lack of pharmacological knowledge, stressful work environments, and human factors (Cheragi, Manoocheri, Mohammadnejad & Ehsani, 2013). Results of these studies indicated that more work is needed to evaluate the impact of the nurse's role in patient safety.

Choi et al. (2014) explored how the role of advocacy on the part of the nurse has led to safe practices in hospitals. Other studies have suggested that when nurses are involved in making decisions and giving suggestions about safety, their perception of patient safety is increased (Mwachofi et al., 2011). Garon (2012) found that nurses who can advocate for their patients are satisfied in their job and feel as though their work environment is healthy and safe. Implications from the current study include the importance of creating a culture of communication among care providers to ensure safe and quality care for patients.

Recent research has focused on the establishment of a patient safety culture within the hospital system (Ulrich & Kear, 2014). Ammouri, Tailakh, Muliira, Geethakrishnan, Phil, and Al Kindi (2015) found that a patient safety culture is related to teamwork and handoffs. Staffing levels and leadership are factors that have been associated with maintaining a patient safety culture (Feng, Bobay, Krejci, & McCormick, 2012). Alenius, Tishelman, Runesdotter, and Lindqvist (2014) examined how the work environment correlates with nurses' assessment of patient safety. Nurses' perceived assessment of an organization's safety culture was based on effective nurse-physician communication and the visibility of nursing leadership (Alenius et al., 2014). Phelps and Barach (2014) suggested that health care quality can be improved by the collaboration of key stakeholders including policymakers, consumers, and clinicians.

The 1999 IOM report outlined recommendations to address the health care crisis associated with medical errors. The IOM report offered recommendations that focused on ways to make the health care delivery system safer. Kowalski and Anthony (2017) found

that evidence-based improvements in patient safety have been recommended, yet there continues to be poor compliance from health care providers. Medical errors in health care include but are not limited to wrong site surgery, hospital acquired infections, falls, and medication errors (Chassin, 2013). Banihashemi et al. (2015) found that the lack of resources, protocols, and standardized checklist resulted in medical errors. Even though evidence-based safety strategies have been adopted to reduce errors, serious mistakes are still occurring. The complexity of the health care system requires a multifaceted approach to find improvements in a failed system, and researchers have explored innovative ways to improve quality and safety (Ulrich & Kear, 2014).

Previous studies have addressed safety cultures but not the direct influence that nurses have on patient safety (P. S. Groves, Meisenbach, & Scott-Cawiezell, 2011). P. S. Groves, Finfgeld-Connett and Wakefield (2014) suggested that more research is needed to explore the critical role that nurses play to keep patients safe. There was a gap in the literature related to nurses' perception of their role in patient safety and why patients continue to be harmed despite evidence-based safety strategies available. Studies have not addressed the role nurses play in keeping patients safe, and there has been no documented literature addressing nurses' perception of why errors are still occurring.

Hospitals are supposed to be a place of healing, and nurses have a contract with society to prevent harm (ANA, 2010). It was necessary to gain new insights on nurses' perception of their role in patient safety and their understanding of why adverse events are still occurring despite evidence-based safety strategies. Nurses play a prominent role in protecting patients as their frequent interaction with patients allows them to monitor

patients and detect declines in health. It was important to gain a deeper understanding of how nurses perceive their role in patient safety. This study may shed new light on why medical errors are still occurring. To prevent continued harm to patients, it was critical to extend knowledge of how nurses can keep patients safe.

Problem Statement

Patients are harmed daily in the hospital setting despite the volume of research that has been conducted on patient safety for the past two decades (Makary & Daniel, 2016). Nurses provide direct bedside care to patients and are exposed to several potential errors during their shift that can cause potential harm to a patient (Choi et al., 2014). Circumstances such as the wrong medication being dispensed from the pharmacy or a physician writing for the wrong procedure on a patient are examples of errors that nurses detect to keep patients safe (Chassin, 2013). Numerous best practices have been implemented to reduce medical errors and improve patient safety, and nurses play a central role in implementing many of these best practices (Kai & Lipschultz, 2015; Ohashi, Dalleur, Dykes, & Bates, 2014).

There is a growing concern that despite the fervent and increasing focus on preventing medical errors, small achievements have been made in patient safety efforts. It was necessary to study the perception of nurses regarding their role in delivering safe and efficient care and to examine their perception of why adverse events are still happening despite the implementation of safety strategies. Having a clear understanding of what nurses do, how nurses perform tasks, and why nurses respond the way they do may increase awareness of the unique contribution that nurses make in keeping patients safe.

This study was based on prior research regarding nurses' perception of patient safety and medical errors. Although researchers have described the role of the nurse and their perception of safety cultures on preventable medical errors, this information has been based on methods focused on strategies such as surveys. A grounded theory approach may lead to the development of a theoretical framework addressing nurses' perception of their role and why medical errors are happening despite evidence-based safety strategies in place. This study filled the gap in understanding from nurses' perspective why medical errors are still occurring.

Purpose

The purpose of this qualitative grounded theory study was to examine nurses' perception of their role in patient safety and to explore nurses' perception of why errors are still occurring despite the implementation of evidence-based safety strategies. Through analysis of focus group interviews, a theory emerged that was grounded in the data obtained from the participants to explain why medical errors are still occurring despite evidence-based safety strategies that have been implemented in the past two decades.

Research Questions

The research questions that were explored in this study were as follows:

1. What are the perceptions of nurses regarding their role in patient safety in a hospital setting?
2. What factors are contributing to patient harm despite the use of evidence-based safety strategies in the hospital setting from the nurses' perspective?
3. Why are preventable medical error events still occurring from the nurses' perspective?

Conceptual Framework

The systems engineering initiative for patient safety (SEIPS) model is a widely used framework in the study of patient safety. SEIPS is a comprehensive model that addresses the complexity of the health care system and has been used in health care research. This model was developed by Carayon and Smith in 2006 (Carayon, 2009; Carayon et al., 2006). This model served as a conceptual framework to guide the interview questions and to organize the results regarding nurses' perceptions of their role in patient safety and why evidence-based safety strategies appear to be ineffective in preventing patient harm. The SEIPS model builds on the structure-process-outcome model developed by Donabedian (Carayon et al., 2014). This model has three components including the work system, processes, and outcomes (Carayon et al., 2006). The SEIPS model expands Donabeian's work by delineating elements of the work system and including the patient, employee, and organizational outcomes. The person, organization, environment, task, and utilization of technology make up the five elements

of the work system within the SEIPS model (Carayon et al., 2006). Because of the complexity of health care, a systematic approach to addressing patient safety problems can be facilitated with the use of the SEIPS model (Carayon et al., 2006; Carayon & Wood, 2010).

Nature of the Study

A grounded theory qualitative approach was selected to explore nurses' perceptions of their role in patient safety and to identify the factors that contribute to adverse patient events despite the implementation of evidence-based safety strategies. Grounded theory methodology was chosen to gather data on the perceptions of nurses who participate in patient safety efforts. Grounded theory methods allowed for the development of a theory surrounding the process of why safety events are still occurring. The nurses' perception of their role was grounded in the data obtained. The development of a theory may guide future research on the role of the nurse regarding patient safety strategies to decrease medical errors.

Charmaz's (2006, 2014) constructivist grounded theory data analysis method was used to gain a deeper understanding of nurses' perceptions of their role and factors that contribute to medical errors. Data collection and analysis were conducted simultaneously throughout the study. Constant comparison is an analysis method within grounded theory used to strengthen the findings. Thematic codes and categories were developed through the reflective process.

Strauss and Glaser first introduced grounded theory in 1967 (Glaser & Strauss, 1967). The grounded theory methodology was further refined by Corbin and Strauss

(Charmaz, 2006). The grounded theory framework is flexible and fluid allowing the researcher to explore the data to create a theory (Charmaz, 2006: Hutchison, Johnston & Breckon, 2010). Through an iterative process, a new theory emerges from the collected data. No theory had been developed prior to this study to explain why patients continue to be harmed despite the use of evidence-based safety strategies.

This study took place in a Magnet hospital. Magnet is a national recognition given to hospitals that demonstrate nursing excellence in the delivery of quality health care services to patients (Kelly, McHugh, & Aiken, 2011; Kramer & Schmalenberg, 2005; Kutney-Lee et al., 2015; Silber et al., 2016). A Magnet hospital was chosen for this study because Magnet hospitals represent clinical excellence in implementing evidence-based practices directly linked to improved patient care outcomes (Wilson et al., 2015). A Magnet facility was ideal to conduct this study because Magnet hospitals have a practice environment that is focused on improving outcomes and have high standards for patient care.

Focus groups with registered nurses were conducted to collect the qualitative data for this study. Focus group interviews are used to capture the participants' perceptions, viewpoints, and feelings related to patient safety (Dilshad & Muhammad, 2013; Krueger & Casey, 2015). The purpose of the focus group was to provide deeper insight into nurses' perception of their role in patient safety and why medical errors still occur despite the use of evidence-based safety strategies. A constant comparison method, including memoing and pattern recognition, was used in the analysis of the data.

Definitions

The following definitions are provided to clarify the meaning of important concepts and terms used in the study.

Adverse event: An unintended injury that results in harm caused by a health care worker (Zegers et al., 2009).

Evidence-based strategies: Research-based practices implemented in the clinical setting, leading to improved patient care outcomes (van Achterber, Schoonhovan, & Grol, 2008).

High-reliability organizations: Organizations in which catastrophic events have been significantly reduced due to processes, leadership, and culture (Chassin & Loeb, 2013).

Just culture: An environment in which system failures are recognized as the root cause of errors, as opposed to individual failures; an environment in a hospital setting that is not punitive and in which personal accountability is achieved among employees (Sammer, Lykens, Singh, & Mains, 2010).

Medical error: An unintended result resulting in harm to the patient based on either omission and commission or planning and execution (Grober & Bohnen, 2005).

Misuse: The inappropriate or wrong health care strategy applied to a patient resulting in harm or an adverse event (Chassin, 2013).

Near miss: An error that happened but did not reach the patient (Agency for Healthcare Research and Quality, 2017).

Nursing surveillance: A strategy used by nurses to improve patient outcomes in the hospital setting. Surveillance focuses on the collection and analysis of data (Henneman et al., 2012).

Overuse: The unnecessary use of health care services rendered to a patient (Chassin, 2013).

Patient safety: The prevention of errors and adverse effects to patients associated with health care (World Health Organization, 2017).

Preventable adverse events: Events that are "avoidable by any means currently available unless that means was not considered standard care" (Agency for Healthcare Research and Quality, 2017, p. 1).

Preventable harm: Harm that is identified as avoidable (Nabhan et al., 2012).

Safety: To be free from harm (Aspden et al., 2004).

Safety culture: An organization with shared values and beliefs regarding safety (Sammer et al., 2010: Singer, Lin, Falwell, Gaba, & Baker, 2009).

Serious safety events: Deviations from a practice or process that reach the patient and in which severe harm or death occurs (Hoppes, Mitchell, Venditti, & Bunting, 2013).

Underuse: The lack of providing a health care service that will result in the improvement of patient care outcomes (Chassin, 2013).

Assumptions

Assumptions are made regarding circumstances beyond the control of the researcher that are accepted as true throughout a study (Grove, Burns, & Gray, 2013). The following assumptions were made in the study:

1. The participants provided honest feedback during the interviews.
2. The participants desired to provide safe care to patients and not to harm them intentionally or unintentionally by making errors.
3. Nurses participating in the focus group discussion were comfortable with expressing their thoughts and ideas about patient safety.

These assumptions were believed to be true but could not be verified. For the study results to have value, it was necessary to assume that the research subjects were honest in their responses and that their experiences yielded new insights regarding the study topic.

Scope and Delimitations

The purpose of the study was to explore how nurses perceived their role in patient safety and why medical errors are still occurring despite having best practices available. Delimitations mark the boundaries of a study. The specific population included in this study was nurses who work in the state of California at a Magnet facility. I excluded non-Magnet hospitals. It is appropriate to conduct this study at a Magnet hospital because Magnet hospitals have demonstrated that their practice environments have increased nursing satisfaction, utilization of best practices, and healthy work environments (Kelly et al., 2011). Based on the literature, Magnet facilities have lower patient mortality rates compared to non-Magnet hospitals (McHugh et al., 2013). Magnet hospitals are known for demonstrating high standards in nursing care. I chose a Magnet hospital to gather meaningful data on why errors are still occurring despite the implementation of best safety practices.

The participant inclusion criteria included nurses with more than 1 year of experience as a registered nurse. Exclusion criteria included any registered nurse who had been hospitalized in the past 6 months or who was involved in a serious safety event in the past 6 months. Other noted boundaries in the study related to the conceptual framework. Because health care organizations are complex systems that lead to various patient safety issues, the SEIPS model was chosen because it includes a systems approach that captures the complexity and the multiplicity of factors that contribute to errors. The Reason, Vincent, and Donabedian models did not offer the same strengths as the SEIPS model (Donabedian, 1988, 2005; Reason, 2000; Vincent, Taylor-Adams, & Stanhope, 1998). The Reason/Vincent model did not address processes and system redesigns, and the Donabedian model had a narrow focus on structure (Carayon et al., 2006). The SEIPS model is a more comprehensive model because it is an extension of the structure-process-outcome model developed by Donabedian in the late 1970s and the model developed by Smith and Carayon (Carayon et al., 2014). The SEIPS model was an appropriate tool because it considers the system components that cause adverse events and can be used to address patient safety involving the patient, employee, and organization (Carayon, 2006; Carayon & Wood, 2010; Carayon et al., 2014).

Lincoln and Guba (1985) referred to transferability as a qualitative study's equivalent to external validity. Dependability is referred to as reliability as seen in quantitative studies (Connelly, 2016). Transferability was enhanced in this study by providing thick descriptions of the research participants, location, and context of the study (Amankwaa, 2016). Journaling and having the study findings and conclusions

confirmed by another researcher were techniques employed to strengthen the transferability and dependability of this study (see Amankwaa, 2016; Connelly, 2016; Lincoln & Guba, 1985).

Limitations

The transferability of the study was limited because I used a single hospital site. Researcher bias may have also been a limitation. Measures that can be used to address the study's limitations include acknowledging researcher biases and respondent validation (Maxwell, 2013). To ensure trustworthiness in a study, a researcher should establish credibility, transferability, dependability, and confirmability (Amankwaa, 2016). Techniques that were used for trustworthiness included member checking, thick description, audit trails, and journaling (see Amankwaa, 2016). A standardized tool for interviewing was used to decrease the chance of interviewer bias by having a standard process of collecting data (see Frankfort-Nachmias & Nachmias, 2008).

Significance

High-reliability organizations have been used as a model for safety. The airline industry and nuclear power plants have made significant improvement in safety efforts, while the health care industry has lagged behind (Chassin & Loeb, 2013). Documented incidents of patient harm have demonstrated failures in the health care system. Medical errors have highlighted the need for significant change to the way health care is delivered to patients (Phelps, & Barach, 2014). .Chassin (2013) suggested that older strategies are being used to address the complexity of current patient safety problems with limited

success. Limited improvements in quality and safety demonstrate how deeply complex the health care system is and that there is not a one-size-fits-all solution (Chassin, 2013).

This study made a contribution to patient safety initiatives in the health care field because there had not been studies addressing nurses' perceptions of why errors are still occurring despite the use of safety strategies. The findings advanced knowledge in the nursing discipline by revealing how nurses influence patient safety and why medical errors are still occurring from nurses' perspective. The primary social change implication from this study was to improve the quality and safety of patient care by understanding the pivotal contributions that nurse's play regarding patient safety. Advancing the understanding of nurses' perception of their roles in preventing errors and why errors are still occurring may lead to a reduction in medical errors. The findings added to the advancement of the nursing discipline surrounding patient safety.

Summary

Morbidity and mortality have been reduced based on the actions of the nurse (Mwachofi et al., 2011). Nurses have helped reduce complications associated with infection and have also reduced pressure ulcers associated with bed rest (Kowalski & Anthony, 2017). Even though nurses facilitate patient safety efforts and reduce harm to patients by implementing evidence-based safety practices, adherence to these safety practices continues to be a concern (Smeulers et al., 2014).

Health care providers do not come to work with the intention of harming a patient. Patients who are hospitalized expect to be taken care of in a safe, efficient, quality manner. It is imperative that leaders in health care support patient safety efforts to

ensure the safety of patients. This study provided new knowledge related to how the nursing role is vital to keeping patients safe and why medical errors are still happening. In Chapter 1, I presented the study purpose, guiding framework, and social change implications. In Chapter 2, I review the scholarly literature related to patient safety supporting the need for this study. I also describe the SEIPS model that was used to guide this study to explain the relationship between work systems, processes, and outcomes related to patient safety.

Chapter 2: Literature Review

The purpose of this study was to examine nurses' perception of their role in patient safety and to explore nurses' perception of why errors are still occurring despite the implementation of safety strategies. Although numerous safety strategies have been implemented, such as safety checklists, communication tools, and health information technology systems, preventable medical errors continue to happen (Abramson et al., 2014; Makary & Daniel, 2016; McCann, 2014; Zikhani, 2016). Leape et al. (1993) categorized medical errors into four groups: diagnostic errors, treatment errors, preventive services errors, and other errors related to equipment and systems failures. Measures to address this safety crisis included increasing the number of registered nurses to care for patients and investing in technology that has decreased adverse events (Aiken et al., 2011; Kane, Shamliyan, Mueller, Duval, & Wilt, 2007; McCann, 2014). The health care environment is complex, and the risk of medical errors is high (Zikhani, 2016). There was a gap in the literature related to nurses' perception of why medical errors are still occurring despite evidence-based safety strategies.

In this chapter, I describe the literature search strategy and review the conceptual framework and relevant literature. The SEIPS model was used to guide the study. I review studies that supported the adoption of grounded theory and focus groups as methods to examine nurses' perception of patient safety. The chapter concludes with a summary of the major themes in the patient safety literature and what is known and not known about nurses' role in patient safety. I highlight the gap in the literature about why medical errors continue to occur despite evidence-based safety strategies.

Literature Search Strategy

I employed an iterative literature search process by using the Walden University library databases. The databases that were used for this study were as follows: EBSCO Host, ProQuest, PubMed, and SAGE. The search criteria filters consisted of peer-reviewed journal articles, dissertations, systematic reviews, books, and quality reports about patient safety. To ensure germane scholarship, I also used Google Scholar to search the literature for grounded theory methods and research related to patient safety.

I conducted a multiple database search consisting of CINAHL, Medline, and Thoreau. The following terms were used to provide a comprehensive review of the topic: *medical errors*, *nursing perception*, *patient safety*, *high-reliability organizations*, *just culture*, *sentinel events*, *adverse events*, *serious safety events*, and *workarounds.* To further explore the literature, I conducted a second literature search using the following terms: *preventable harm*, *never events*, *smart pumps*, *nursing role*, *grounded theory*, *safety culture*, *near miss events*, *evidenced-based strategies*, *patient outcomes*, and *SEIPS framework*. Boolean techniques were used to narrow the search on literature related to patient safety. Examples of Boolean searches included *patient safety* AND *grounded theory*, which yielded articles related to patient safety and the chosen methodology. The Boolean search for *SEIPS model* OR *patient safety* yielded results related to the conceptual framework and patient safety.

Search limits consisted of peer-reviewed articles published within the last 5 years written in English. I conducted additional searches after reviewing the reference lists of articles to see what other publications existed on the topic. The articles were published

between 1989 and 2017. I also reviewed information from prominent patient safety websites such as the Emergency Care Research Institute (ECRI), Agency for Healthcare Research & Quality (AHRQ), and The Joint Commission. These sites offered information about root causes for errors, safety strategies to prevent errors, and information on how to classify medical errors. The purpose of these sites is to support health care organizations to proactively work on ways to improve patient safety.

Conceptual Framework

I used the SEIPS model as the conceptual framework for this study. The SEIPS model consists of the work system, care processes, and outcomes, and expands on the Donabedian model by including human factors and the systems engineering approach to patient safety (Carayon et al., 2006). The SEIPS model integrates Donabedian's structure-process-outcome model and replaces the structure component with Carayon and Smith's work system model (Donabedian, 1988; Smith & Carayon-Sainfort, 1989; Carayon et al., 2006; Carayon, 2009; Carayon & Wood, 2010; Frith, 2013). The SEIPS model includes the following characteristics:

> (1) description of the work system and its interacting elements, (2) incorporation of the well-known quality of care model, (3) identification of care processes being influenced by the work system and contributing to outcomes, (4) integration of patient outcomes and organizational/ employee outcomes, and (5) feedback loops between the processes and outcomes, and the work system. (Carayon et al., 2014. p. 3)

The SEIPS Model and its constructs were used to organize the literature in this study.

In the SEIPS model, the structure includes the characteristics of the work system in which care is provided. Processes include care processes that represent the activities that are performed to deliver treatment and other processes such as information flow, purchasing, maintenance, and cleaning. Outcomes include patient, employee, and organizational outcomes (Carayon et al., 2006). The SEIPS model is shown in Figure 1.

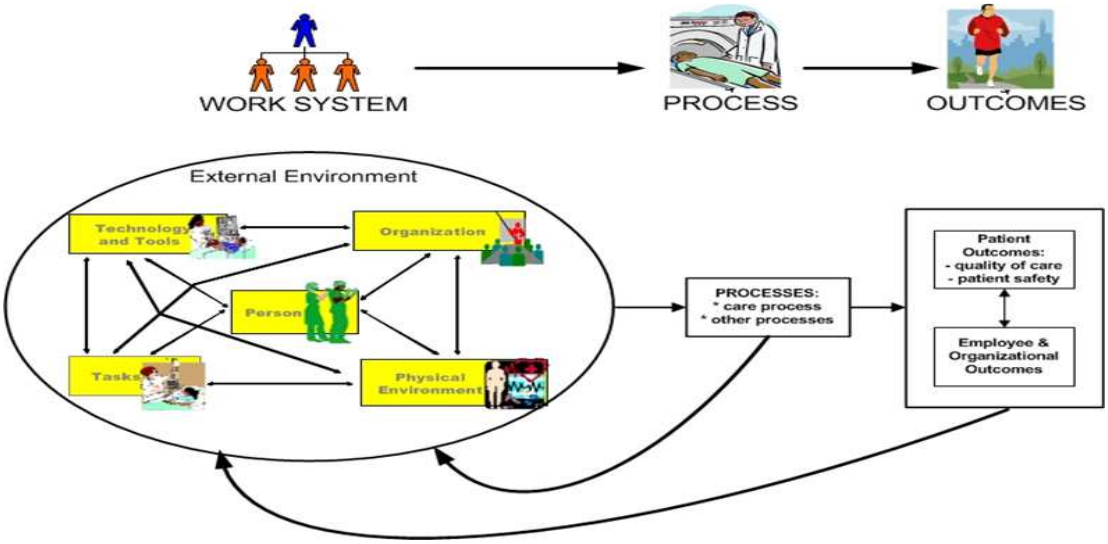

Figure 1. The SEIPS model composed of the work system, process, and outcomes. Adapted from "Work system design for patient safety: The SEIPS model" by P. Carayon, A. S. Hundt, B. Karsh, A. P. Gurses, C. J. Alvarado, M. Smith, & P. F. Brennan, 2006, *Quality Safety Health Care, 15*(1), i50-i58.

Work System

In the SEIPS model, the work system interacts with care and other processes that influence quality and safety outcomes for patients, as well as the employees and the organization (Carayon et al., 2006; Carayon & Wood, 2010; Frith, 2013). The elements of the work system include technology, organization, task, environment, and the person

(Smith & Sainfort, 1989). The work system consists of five elements, and a change in any of these elements impacts the other elements (Carayon et al., 2006).

The SEIPS model integrates the concepts of the balance theory in the work system design (Carayon et al., 2006). Balance is needed so that the work system does not negatively impact the outcomes for the provider as described by this model. If there is an imbalance in one element of the work system, another element can help add balance. For example, if there is a shortage of nurses for a particular shift, this imbalance can be addressed through efficient teamwork and collaborative efforts among staff (Carayon, et al., 2006). If balance is not achieved, it can lead to human factors that negatively influence patient safety outcomes. Characteristics of human factors include the providers' capabilities and limitations and can be affected by physical and psychological stress (Carayon & Sainfort, 1989). Principles of human factors engineering must be considered when finding ways to improve patient safety (Xie & Carayon, 2015). A person's training, workload, work environment, and interaction with technology play a significant part in the role of human factors. Human factors characteristics are important to consider when looking at the design and usability of tools and technologies because these factors impact the workflow of the providers to deliver safe care. When a new safety initiative is introduced, it is important to take into account the effects of human factors on safety.

In the SEIPS model, the work system includes the person, tools and technology, environment, tasks, and organization (Carayon et al., 2006; Carayon et al., 2014). The person is at the center of the work system and interacts with all of its components. The person can be any health care provider or a team of care providers, as well as the patient

receiving care (Carayon et al., 2006). Education, skills, knowledge, motivation, and physical and psychological characteristics are elements of the person component found in the work system structure. For this study, the registered nurse was the person in the SEIPS model because the registered nurse interacts with all elements of the work system. Organizational culture was identified as the organization in the external environment component of the work system.

The tools and technology component of the work system consists of the technology that the person will use, such as computerized provider order entry, electronic health record, and bar coding of medications, while checklists and daily worksheet goals are examples of the tools component (Carayon et al., 2006; Halm, 2008). Tasks within the work system are indirect care activities that represent the duties or responsibilities that the person will carry out or perform. Tasks can be diverse, and providers are affected by job demands regarding workload, time pressures, cognitive load, and need for attention while performing tasks. Other elements of task include autonomy, utilization of skills, and job control (Carayon et al., 2006). The environment includes the physical environment in which the person works and factors like lighting, work station design, and noise levels. The organization includes elements of teamwork, coordination, and communication. Organizational culture includes patient safety culture, work schedules, management styles, performance evaluations, rewards, and incentives (Carayon et al., 2006). Carayon et al. (2006) suggested that changes to any aspect of the work system will have a negative or positive effect on outcomes, which in turn affect the patient,

employee, and organization. The effect on work and clinical processes depends on the way change or improvement is designed and implemented.

Processes

According to Donabedian (1998), processes include the act of delivering care. Processes consist of the patient seeking medical care as well as the provider performing treatment care based on the patient's diagnosis (Donabedian, 1998). The SEIPS model expands the concept of processes to include other items that focus on providing, delivering, and managing care like maintenance and housekeeping that support care processes (Carayon et al., 2006). Elements within the other processes component of the SEIPS model include processes related to improvement activities, information flow, and maintenance (Carayon et al., 2006). In the SEIPS model, the process can be influenced by the design of the work system, and the work system and processes affect the outcomes in which safe care is delivered.

Processes in this study focused on evidence-based safety strategies. For example, nursing surveillance is a process strategy used to prevent errors and improve patient safety (Henneman et al., 2012). Safety strategies include increasing nursing surveillance and utilizing barcode scanning, electronic charting, and smart infusion pumps. These strategies have been implemented to help reduce patient harm events (Helmons, Wargel, & Daniels, 2009; Henneman et al., 2012; Ohashi et al., 2014). Zikhani (2016) outlined six safety strategies to decrease medical errors: (a) education and training, (b) rules and policies, (c) double checks and checklists, (d) standardization, (e) automation and

computerization, and (f) forcing functions. Both ineffective and effective processes can influence outcomes.

Outcomes

Outcomes are assessed by examining components of employee and organizational outcomes as well as patient outcomes (Carayon et al., 2014). Job satisfaction, job stress, turnover rates, employee safety, and organizational profitability are elements of employee and organizational outcomes (Carayon et al., 2006). Patient safety and quality of care are elements of patient outcomes (Carayon et al., 2006; Carayon et al., 2014). Donabedian (1998) described outcomes as the measurement of the patient's knowledge of their care and as improvements in the behavior of the patient related to their health.

Patient outcomes are influenced by the interaction between the work system and the processes in place. One strength of the SEIPS model is that it can be used to examine work system designs that are resulting in patient harm and employee injury (Carayon et al., 2006). Carayon et al. (2006) noted that feedback loops exist between outcomes and the work system and between processes and the work system. If processes or outcomes are poor, there needs to be a redesign of the work system Carayon et al., 2014). The redesign of the work system occurs when problems have been identified from the data associated with either processes or outcomes (Carayon et al., 2014). Identification of problems occurs when there is a continuous improvement cycle approach to patient safety. For this study, outcomes focused on patient outcomes.

Application of the SEIPS Model in Research and Practice

The SEIPS model has served as a framework used by researchers and educators to examine patient safety events (Carayon, et al., 2014). A macro-level systems approach opposed to a micro-level approach to investigating patient safety can be done by applying the SEIPS model to improve areas of safety. This model is comprehensive and its use is vital in understanding the complexity of patient safety issues (Carayon et al., 2014). As suggested by Carayon and colleagues (2014), the SEIPS model can be valuable in the analysis of (a) patient safety events, (b) high risk care processes, (c) safety concerns associated with new technology, and (d) education and training. Identification of factors associated with serious safety events can be further analyzed with the SEIPS model approach. Information gained can lead to possible redesigns of systems to promote safety (Carayon, et al., 2014).

The application of the SEIPS model has been widely used in a variety of settings to evaluate safety in areas such as the intensive care unit, pediatrics, primary care, and outpatient surgery (Carayon et al., 2014). Additionally, Peter Pronovost, one of the leaders in patient safety from Johns Hopkins has adopted and embraced the SEIPS model to improve patient safety (Pronovost et al., 1999). The SEIPS model has been applied to the discipline of pharmacy assessing work system barriers (Choi et al., 2013). The SEIPS model has also been used to evaluate compliance regarding patient care guidelines used by nurses as well as physician compliance with CPOE (Gurses et al., 2010; Holden, 2011). Non-compliance to established protocols and guidelines can increase patient safety events (Catchpole, 2013). The application of the SEIPS model has similarly, been

applied to the assessment of the effectiveness of the electronic health records and technology (Sittig & Singh, 2009).

In a review of the literature on medication errors, Frith (2013) used the SEIPS model to examine the research on medication systems. Findings suggested that human factors such as stress, increased workloads, and knowledge deficits are associated with medication errors. The utilization of the SEIPS model in this review described how there are other contributing factors to medication errors such as frequent interruptions, poor communication, and health information technologies that do not fit the work flow of providers (Frith, 2013). The work of Carayon and Gurses (2008) support the previous findings of Frith in relationship to how the nurses' workload can influence patient safety (Carayon & Gurses, 2008). The authors found that there was inadequate time to perform necessary tasks because of an increased workload. Findings from Carayon and Gurses (2008) suggest that communication and collaboration between the nurse and the physician were compromised when the workload of the nurse was increased. Implications for future research based on the study suggest the need to redesign the work system design for the nurse to improve patient care delivery (Carayon & Gurses, 2008).

Criscitelli (2015) shared how the SEIPS model can be used to evaluate our current health care delivery system in the perioperative setting. Criscitelli (2015) posed that the SEIPS model offers a broad assessment of patient safety issues experienced in the operating room regarding the environment and technology which led to improvements in patient safety from the knowledge gained (Criscitelli, 2015). Similarly, this model was used to explore interventions for patient safety in the outpatient surgery environment

(Carayon, Schoofs, Alvarado, Springman, Borgsdorf & Jenkins, 2005). Xie and Carayon et al. (2015) posed that patient safety can be examined with this conceptual framework because of its systematic approach that captures the complexity of the healthcare system. The SEIPS model has been greatly utilized throughout healthcare. This study will benefit from using this model as it takes a macro approach in examining the many factors which influence patient safety.

Literature Review Related to Key Variables and/or Concepts

This literature review will focus on the following concepts of the SEIPS model, the person (nurses role), organization (organizational factors), care and other processes (evidenced based safety strategies), and patient outcomes (medical errors). The literature review will commence with a synthesis of studies that have used a Grounded Theory approach to advance the knowledge of the nurse's role in patient safety and medical errors. An exhaustive review and synthesis of relevant studies of four key constructs, including the nurse's role in patient safety, organizational factors**,** evidenced based safety strategies, and medical errors, will be presented.

The research methods used to examine the nurse's role in patient safety will be explored, the strengths and weakness of these approaches will be highlighted, and the rational for selecting a Grounded Theory approach will be summarized. Literature which justifies the selection of the four key study concepts will be reviewed followed by an exhaustive review and synthesis of studies related to the key concepts. The state of the science will be examined and will include a consensus of what is known about the nurses' role in patient safety, controversial issues, and areas in need of further study.

Chosen Methodology

In nursing research, the grounded theory approach has been used in previous patient safety studies. Nursing handoff, reporting of medical errors, utilization of best safety strategies, and nursing role perception in safety are among the topics explored using grounded theory methods (Groves, Finfgeld-Connett & Wakefield, 2014; Groves, Manges, Scott-Cawiezell, 2016; Leger & Phillips, 2017; Wahle, Haugen, Softland & Hjalmhult, 2012). Theory development of "Exerting Capacity" based on the nurses' perception brought new insight into how nurses' work to keep patients safe when stretched to capacity (Leger & Philips, 2017). While Groves et al. (2014) developed the theory development of "Managing Risk". The authors examined the process used by nurses to keep patients safe. Study results indicated that patients are always exposed to risk in the hospital setting and that nurses continuously do risk assessments and prioritize care based on their recognition of risk. This is important because nurses can recognize clinical changes or declines in their patients' condition and alert the medical team.

The work of Leger and Phillips (2017) highlighted how nurses balance many responsibilities during their shift to safeguard patients. Nurses are faced with multiple tasks and interphase with different healthcare disciplines. In this grounded theory study, it was identified that nurses are committed to keeping their patients safe and will do whatever is necessary to watch after their patients' wellbeing even if it means being overextending themselves. This is concerning for this can lead to nursing burnout and possibly decrease the quality of care delivered to patients leading to medical errors. Similarly, both studies describe the nurses' role in patient safety. The authors suggested

that safety cultures further support how nurses' function. It is important to additionally investigate what else nurses do in their daily work and how they perform their task in efforts to improve patient safety. Another grounded theory study (Cathro, 2016) reported on the role that charge nurses play when it comes to patient safety. Using a grounded theory approach the theory of "Navigating through the Chaos" emerged highlighting three major themes; balancing multiple roles, maintaining a watchful eye on quality indicators, and collaborating with multidisciplinary teams. Similarly, these studies recognized that nurses work in high-stress environments and are pulled in various directions during their shift. Nurses, regardless of overseeing the unit or at the sharp end delivering direct bedside care contribute to patient safety. While the articles used in this research shared recommendations for nurse leaders and administrators to use to ensure patient safety, the authors established theories that bring insight into how complex the health care system can be and that nurses play a vital role in protecting patients from harm daily through continuous assessment, patient advocacy, and care collaboration.

Based on this nursing research it is evident that there are many factors needed in keeping patients free from harm and that nurses are in a unique position to enact safety measures. Nurses are human and can be part of a medical error leading to a serious safety event. Learning from these events or errors will further safeguard patients in the future. Koehn et al. (2016) examined the reporting of medical errors using grounded theory. The theory of "Learning Lessons from the Error" emerged. This study informs the literature on ways to improve error reporting and the importance of supporting nurses once an error has been made. Being able to report errors in a work environment that is non-punitive

will further lead to an increase in reporting so that leaders can find ways to improve safety standards. In the study presented by Koehn et al., (2016), one of the lessons learned is that many medical errors occur during handoff when a patient is being moved throughout the healthcare system (Groves, et al., 2016). During patient handoff, there is crucial information being shared about the patient from one healthcare provider to another. Communicating pertinent information is vital in the safe continuum of care. Therefore, nurses impact patient safety through effective handoff.

These grounded theory studies shared data about how the nurses' role influences patient care outcomes. By using a grounded theory methodology this study will present a theory about the nurses' perspective concerning their role in patient safety and why medical errors continue to happen despite having safety strategies available adding to the patient safety literature.

Researchers' Approach to Patient Safety

Although many quantitative and qualitative approaches have been researched in patient safety, there are still barriers that exist impeding improvements in patient safety (Landefeld, Sivaraman, & Arora, 2015). Strengths of previous and current research have demonstrated that patient safety is a problem that requires all health care providers to identify how their role contributes to patient safety efforts. Based on the literature, healthcare is complex and the approach to patient safety is multifactorial. A singular approach to patient safety will not help make a significant reduction in medical errors.

Researchers have approached patient safety from various angles inclusive of examining nursing roles, promoting organizational safety culture, leadership training,

patient involvement, to evidenced based safety strategies (Kowalski and Anthony 2017; Ulrich, 2015; Weaver, Lubomski, Wilson, Pfoh, Martinez & Sydney, 2013). Constructing work environments that implement and enforce safety policies, are non-punitive, collaborative, and have a just culture are ways the healthcare industry has promoted patient safety (Berland, Natvig & Gundersen, 2008; Tocco & Blum, 2013). The health care industry has even adopted strategies utilized by high reliability organizations such as the airline industry and nuclear power plants to ensure safe practices (O'Neil & Kriz, 2013; Casler, 2013; Padgett, Gossett, Mayer, Chien, & Turner, 2017).

Justification From the Literature and the Rationale for Selected Concepts

Preventable adverse events are associated with systems failures and human error (Zegers, et al., 2009). Human factors, communication, and health information technology have been identified by the Joint Commission as contributing factors most frequently associated with medical errors (Joint Commission, 2015). The Joint Commission consistently shares the National Patient Safety Goals to improve patient safety in hospitals. The Joint Commission shares evidenced based strategies to coincide with their selected goals. To improve patient identification the suggestion of using at least two patient identifiers when providing care or treatment is recommended. By using the strategy of two patient identifiers, there should be a decrease in errors associated with blood transfusions, procedures, medication administrationand specimen collection. The Joint Commission suggests evidenced-based practice strategies to prevent surgical site infections (SSI). For example, strategies of practice guidelines, and the implementation of policies are suggested ways to decrease SSI's. Based on further review of the literature,

human behavior of non-compliance and deviation from best practices has contributed preventable harm events (Carthey, Walker, Deelchand, Vincent, & Griffiths, 2011). In addition to establishing and maintaining evidence based safety strategies a safety culture in the hospital is just as important in keeping patients free from harm.

An organization that has a culture that focuses on patient safety is influential in decreasing harm events. Having a just culture is one way an organization promotes patient safety (Tocco & Blum, 2013). A just culture removes individual blame when a serious safety event occurs but examines systems issues that have failed leading to a serious safety event. A just culture leads to an environment where employees can speak up for safety, share safety concerns, and contribute to possible solutions. Leaders are vital in promoting and maintaining a just culture where errors can be reported without fear of retribution. Leaders can hold staff accountable to their safety practice by taking a no blame approach to safety (Wachter & Pronovost, 2009).

Conducting focus group interviews will yield unique points into how the nurse is thinking about how their role contributes to safety. Group interaction during the focus group discussion may be beneficial affording the nurse the opportunity to link concepts of the patient safety phenomenon that would have been difficult to explore in an individual interview. The selected concepts of the nursing role, organizational culture, evidenced based safety strategies, and medical errors will narrow the focus of this patient safety study. These four concepts have been explored in the literature and are in alignment with the chosen research questions. Further investigation is needed to see how nurses further contribute to safety and what specific tasks or behaviors conducted by the

nurse safe guards patients. It is also equally important to gain a deeper understanding of the nurses' perception regarding why medical errors continue to occur despite our best efforts of implementing safety strategies. The registered nurse can provide this insight since they provide continuous patient care.

The Nurse's Role

In the SEIPS model, the person is at the center of the work system (Carayon et al., 2006; Carayon et al., 2014). The person in the work system for this study is the registered nurse. When analyzing the nurses' role in the context of the SEIPS model, nurses play and will continue to have a crucial role in safeguarding patients from harm (Choi, et al., 2014; Henneman, et al., 2012). Nurses are historically viewed as champions of patient safety. More research is needed in how their role can continue to influence patient safety. First, much of the literature suggests that nurses are in a unique position to continuously safeguard patients (Henneman, Gawlinski, Blank, Henneman, Jordan, & McKenzie, 2010). Nurses influence patient care outcomes by assessing patients and recognizing changes in patient status (Allen, et al., 2015). Nurses work collaboratively with other disciplines and will escalate care if needed (Schneider, 2012). Hughes and Clancy (2009) also acknowledged that part of the nurses' role centers on coordination and implementation of care.

Choi et al., (2014) found that the role of nursing advocacy had a significant part in contributing to a decline in patient safety events. The role of the nurse whether it is related to advocacy, promotion of nursing interventions, and teamwork illustrates that nurses play an essential part in maintaining the safety of patients. The literature on

nursing roles and how it relates to patient safety suggests that the nursing discipline has made distinct contributions to patient safety (Cathro, 2016; Henneman, et al., 2010). The literature suggests that it is necessary to explore other nursing roles that contribute to patient safety such as care coordination and continuous assessment (Hughes & Clancy, 2009; Needleman & Hassmiller, 2009; Shekelle, 2013).

Hughes and Clancy (2009) suggested that nurses need to be aware of their interventions and role contribution in patient safety. Although nurses are able to intercept medical errors and use evidence based safety strategies, medical errors remain the third leading cause of death in hospitals (Makary & Daniel, 2016). The work of Henneman and Gawlinski's (2004) centered on how the nurses' role is vital in the interception of medical errors before they reach the patient. They found that nurses are instrumental in both detecting and correcting medical errors. Likewise, Brilli et al. (2001) identified how the nurses' role involves assessment, continuous monitoring, and patient evaluation. Both studies are in alignment with how the role of the nurse protects patients from harm.

Communication failures between healthcare professionals are catalysts for patient safety events. Nurses are at the forefront of hospital care as they interact with patients and multiple health care providers. The nurses' role in communicating pertinent facts to other nurses during handoffs and escalating patient problems or concerns to physicians is a major component of their job responsibility (Nadzam, 2009). The role of the nurse can be influenced by organizational culture.

The Organization

Concepts related to organizations implementing and maintaining a safety culture by introducing best practices to keep patients safe has dominated the literature over the years (Christ, 2014; Dickerson, Koch, Adams, Goodfriend & Donnelly, 2010; Ohashi, et al., 2014). The establishment and maintenance of a safety culture in hospitals is needed to ensure that safety is a priority at organizations. Ammouri, et al. (2015) identified factors to help maintain a patient safety culture with nursing. The authors concluded that nurses perceived a patient safety culture when leaders communicated feedback about errors to the staff and when effective hospital handoffs were evident. The data, unfortunately, indicated that nurses felt threatened by their leader if they reported errors. In contrast, Morello, Lowthian, Barker, McGinees, Dunt & Brand (2013) further explored the effectiveness of patient safety culture and its relationship to improving patient safety climate outcomes. They found limited evidence regarding the effectiveness of strategies for improving a safety culture and suggested further research should be conducted in using both qualitative and quantitative methods to evaluate the effectiveness of safety strategies to improve a safety culture. It is apparent that leadership drives the culture of an organization. Leaders' that create an environment that is non-punitive, communicates effectively with the staff and makes safety a priority are more apt to have an identified safety culture. The work of Feng, et al. (2012) supported previous literature that teamwork, years of experience, and leadership trustworthiness were identified as contributing factors fostering a safe culture within the hospital. The authors' findings are

useful in providing implications for future research regarding what hospitals can do to establish and maintain a patient safety culture.

Nurses may perceive patient safety differently from the organization. Since nurses continuously care for patient their views in regards to safety is important to analyze. Ballangrud, Hedelin, and Hall-Lord (2012) explored potential predictors that contribute to the nursing perception of safety in an intensive care unit. The authors found that improvements are needed in incident reporting and communication about errors. The authors concluded that nurses perceived a strong safety climate when teamwork was evident and feedback from leaders was received regarding safety events. The research findings suggest investigating other variables that can influence the nurses' perception of a patient safety culture. Further investigation will highlight additional perceptions of safety from the nurses' perspective. Additionally, Khater, Akhu-Zaheya, Al-Mahasneh, and Khater (2015) focused on a patient safety culture in Jordanian hospitals from the perspective of the nurse. In this study, it was found that communication, handoff, non-punitive responses to errors, and teamwork is needed for a patient safety culture to exist. Farup (2015) reached a different conclusion, showing an inverse relationship between a patient safety culture and adverse events. This lack of alignment suggests that further work into organizational safety culture should be explored. While the articles presented have shared concepts of improving a safety culture, it is crucial to understand that only having a safety culture change will not solely impact patient safety and there are other avenues to improving patient safety.

Evidenced-Based Safety Strategies

Evidence based methods are needed to reduce harm to patients. By minimizing errors patients can be safely cared for in the hospital (Kai & Lipschultz, 2015). With the increased interest and research related to patient safety, it is puzzling to imagine why marginal impact has been made in patient safety (Chassin, 2013; IOM, 2001). Numerous patient safety strategies have been adopted in healthcare such as preoperative checklist, bundles for central line infections, and interventions to reduce pressure ulcers (Shekelle2013). Some examples of evidenced based strategies included in this paper are nursing surveillance, noise reduction techniques, health information technology, and conducting medication administration safety strategies.

Dougherty (1985) first introduced the concept of surveillance. Surveillance goes beyond monitoring but incorporates both evaluation and interpretation. Surveillance is a continuous process that occurs throughout the nurses' shift (Kelly & Vincent, 2011; Kutney-Lee, Lake, & Aiken, 2009). Clinical decisions are acted on by the nurse based on their surveillance once the data is gathered, analyzed, and interpreted (Dougherty, 1999). Henneman et al. (2012) found that surveillance is an intervention that nursing has utilized to identify possible medical errors. Surveillance checklists, interdisciplinary rounding, and clinical decision support systems are examples of surveillance tools that have been implemented as best practice strategies to ensure patient safety (Henneman et al., 2012). Poor staffing, nursing skill mix, and lack of collaboration amongst team members have been cited as possible barriers to effective surveillance on the part of the nurse leading to adverse patient events (Henneman et al., 2012).

Best practices strategies have been focused on how to improve work environments. Elements of the environment include noise, layout, and workstation designs (Carayon et al., 2006). Noise, in the work environment, has been documented in the literature as a contributing factor to patient safety events (Mazer, 2012). Noise has interfered with effective communication, leading to confusion amongst healthcare providers causing distractions (Shambo, Umadhay, & Pedoto, 2015). Some of the noise that is created in the hospital comes from technology such as the alarms from the pumps and monitors. With the increase in the number of alarms that are heard throughout the day, alarm fatigue begins to occur resulting in safety risks for patients (Freeman, 2016). Healthcare facilities have been given guidance on how to reduce hospital noise by implementing alarm protocols reducing false alarms (Konkani, Oakley, & Bauld, 2012; Mazer, 2012). Once again, with the introduction of these best practices patient safety remains a concern.

There is documented evidenced that Health IT related to CPOE and clinical decision support systems improve patient safety (Banger & Graber, 2015). The introduction of smart pumps, bar code scanning, and physician order entry are examples of technology strategies that have been implemented to keep patients safe (Christ, 2014: Ohashi et al. 2014; Helmons, et al., 2009). In a systematic review of the literature, six drug adverse events were identified as being reduced by using health IT (Abramson, et al., 2014). The adverse drug events were related to digoxin, IV heparin, hypoglycemic agents, low molecular with heparin contrast nephropathy, and hospital acquire antibiotics associated with clostridium difficile was found to be reduced by health IT (Abramson et

al., 2014). Further work by Whipple, Dixon, and McGowan (2013) reported results consistent with Abramson et al., (2014) linking health information technology to patient safety and quality outcomes. Increased evidence has shown the value in health IT and its support in reducing patient safety events (Encinosa & Bae 2014). The use of the electronic health record demonstrated a significant overall decrease in medication errors and procedure related errors (Hydari, Melang, & Marella, 2014).

Processes performed by nurses include medication administration. Medication errors are one of the most common errors made by nurses. Medication administration is part of the nurses' role and they are in the position to ensure safe administration processes (Smeulers et al., 2014). Safe practices such as checking the patients' five rights that are performed by the nurse have been implemented to prevent medication errors associated with medication administration (Alexis & Caldwell, 2013). Taifoori and Valiee (2015) reported that nurses felt guilty, depressed, and upset when a medication error occurred. The authors found valuable information related to why nurses make errors such as having a feeling of fatigue and being distracted. This study informs the nursing discipline to conduct future research regarding ways to prevent errors.

Similarly, Flynn et al. (2016) focused on the implementation of evidenced based practice strategies in medication administration. Results showed that nurses made errors during medication administration because of interruptions. The authors tested the following strategies of (1) hourly patient rounds, (2) scripts to triage phone calls, (3) protected time during medication passes, (4) signage as visual reminders, (5) implementation of quiet zones, (6) visual cues during medication administration, and (8)

education to patients and families about limiting interruptions during medication administration processes. Although these strategies are different from the ones discussed by Alexis and Caldwell (2013) the implementation of their best practice approached decreased medication errors. Safety strategies continue to be researched to improve patient safety but unfortunately medical errors are still occurring despite having safety strategies available.

Medical Errors

Patient outcomes are influenced by care processes and by the design of the work system (Carayon et al., 2006). Poor patient outcomes are related to costly medical errors to both the patient and the health care industry (Goodman, Villarreal, & Jones, 2011). The National Quality Forum uses nurse sensitive indicators to measure how nurses influences the quality of patient outcomes (Montalvo, 2007). Examples of patient outcomes that are measured related to quality indicators are medication errors, falls, pressure ulcers, mortality, and increased length of stay (Needleman & Hassmiller, 2009). Stone et al. (2007) posed that improving the nursing working conditions influences patient safety outcomes. Other studies have reported (DiCuccio, 2015) that improved patient outcomes are directly linked to the establishment of a patient safety culture. Whereas Halbesleben, Wakefield, Wakefield, and Cooper (2008) suggests that there is a link between nursing burnout and patient safety outcomes. These articles suggest that many factors influence patient outcomes.

In terms of medical errors, it is identified that the work environment has influences on patient outcomes. Kirwan, Matthew, and Scott (2013) researched the

impact of the work environment and its relationship to patient safety outcomes. The authors found that the nursing level of education and the work environment are factors that influence patient safety. The study results linked how having a positive work environment correlates with increased levels of reporting adverse events. This study supported previous literature findings associated with nursing degree levels and patient safety. This study supports the need for organizations to support higher degree opportunities for the members of their staff since education training increases a safe patient environment. In contrast, Umpierrez, Fort, and Tomas (2015) reported that the lack of personnel, increased workload, teamwork, and continuing education of professionals were areas needing significant improvement in promoting safe practice environments. Additionally, Palese, and colleagues research (2013) complements previous studies that express that supportive work environments and collaboration amongst team members impact the effectiveness of the nurses work that influences patient safety outcomes.

Controversial and Remains to Be Studied

Organizations such as the ECRI Institute has listed the top 10 patient safety concerns for 2017. The top patient safety concerns are (1) information management in EHR's, (2) unrecognized patient deterioration, (3) implementation and use of clinical decision support, (4) test result reporting and follow-up, (5) antimicrobial stewardship, (6) patient identification, (7) opioid administration and monitoring in acute care, (8) behavioral health issues in non-behavioral-health settings, (9) management of new oral anticoagulants, and (10) inadequate organization systems or processes to improve safety

and quality. This list serves as a guide for healthcare organizations to see what areas are causing patient harm and proactively work toward reducing patient harm events. This list is annually produced in efforts to improve and address patient safety concerns.

Based on the review of literature, even though there is list of safety concerns and strategies available to reduce medical errors, it is estimated that 1.5 million patients in the United States are injured each year (IOM, 2006). Although the utilization of best practices such as safety checklist can protect the patient from preventable harm, studies have shown low compliance from nurses when using checklist (Wahele et al., 2012). This suggests the need for further research to identify possible reasons for non-compliance with safety strategies and how to promote and support a work environment that exhibits characteristics of a safety culture.

Roth, Wieck, Fountain, and Haas (2015) shared the following reasons as to why medical errors continue to happen from the nurses' perspective (a) loss of focus, (b) unhealthy environments, (c) interpersonal deficits, and (d) being overwhelmed. This work identified themes to patient safety and can serve as a framework for why errors occur but it did not address solutions or corrective actions to mitigate the human factors involved in causing errors. Similarly, another study addressed possible causes to medical errors such as workarounds (Alper & Karsh, 2009). Workarounds conducted by the nurse are considered a violation in either following policies, procedures, or protocols (Alper et al., 2012; Debono, Greenfield, Travaglia, Long, Black, Johnson, & Braithwaite, 2013; Koppel, Wetterneck, Telles, Karsh, 2008). Based on the literature a workaround is done in efforts to circumvent a problem leading to a temporary solution. Unfortunately, this

behavior can compromise patient safety for this temporary fix to a problem is not resolved.

Workarounds can be seen with barcode medication administration. The purpose of the barcode is to prevent a medication error. If the nurse chooses to bypass the system there is an increased likelihood of creating an error. Based on the work of Koppel and his colleagues (2008) workarounds were a result of the design of the technology and problems in workflow. Further exploration of the perception of how nurses work at the bedside can increase our understanding on ways to improve the delivery of healthcare and decrease the number of workarounds. Further exploration is needed in why medical errors continue to occur considering having evidence based safety strategy available and what contributions nurses make to patient safety. Exploration of the nurses' perceptions' of their role related to safety can contribute to sharing new strategies to reduce medical errors. The reason why this warrants further investigation is because safety strategies are available yet preventable patient harm continues. This requires a deeper understanding of this patient safety phenomenon.

Synthesis of Studies Related to the Research Questions

Human errors and systems errors are known contributors to patient safety events. An emphasis on patient safety has been the goal of hospitals since the 1999 IOM report. In terms of safety strategies, frequent and consistent surveillance is a strategy used to help recognize patient deterioration ahead of time. Kelly and Vincent (2011) identified nursing surveillance as an important process to safe guard patients. However, the authors found there is limited evidence in how the surveillance process is operationalized.

Another study (Fasollino & Verdin, 2015) found that there are still unclear components related to how the nurses recognize the deteriorating patient early when conducting their surveillance. This misalignment in the literature suggests the need to explore how a safety strategy such as seen in surveillance further influences patient safety.

Research Questions and Why the Methodology Was Chosen

The concepts of the nurses' role, safety strategies, and medical errors have been explored in the literature and are in alignment with the chosen research questions. There are three main questions of inquiry for this study. (a) What are the perceptions of nurses regarding their role in patient safety in a hospital setting? (b) What factors are contributing to patient harm despite the use of evidence-based safety strategies in the hospital setting from the nurse perspective? and (c) Why are preventable medical error events still occurring from the nurses perspective? Further investigation is needed to gain a deeper understanding from the nurses' perception regarding why medical errors continue to occur despite best efforts of implementing safety strategies. Conducting a focus group study will allow for an exchange of ideas about medical errors and unique contributions of the registered nurse. This study will gather perspectives from the nurses about patient safety.

This chapter's scholarly literature focused on the role that nurses currently play in respects to patient safety and highlighted the need for why one should further explore how nurses contribute to patient safety efforts. The approach selected will be meaningful to the literature because there is an identified gap why medical errors are still occurring

from the nurses perspective and what unique role nurses play to keep patient safe from a grounded theory approach.

Summary and Conclusions

This chapter outlined how improvements in patient safety are still needed nearly two decades after the 1999 IOM report *To Err Is Human*. The overall lack of improvement in patient safety should lead hospitals to take another serious look at safety and advocate more for additional best practices (James, 2013). Longo, Hewett, Ge, and Schubert (2005) acknowledged that an accelerated approach to patient safety is necessary due to the slow progression of patient safety success. The Centers for Medicare & Medicaid Services (CMS) have declined payment to healthcare organizations for eight hospital acquired events that harm patients. Despite the regulations set forth from agencies such as CMS medical errors are still a problem (Downey, Hernandez-Boussard, Banka, & Morton, 2012).

In conclusion, preventable medical errors remain of great concern in healthcare. Medical errors can cause stress amongst healthcare providers and is costly to the patient and the hospital (Banishashemi et al., 2015; Bari, Khan, & Rathore, 2016;). The effects of making an error have been shown to impact the nurse that performed the error throughout the rest of their career (Koehn, Ebright, & Draucker, 2016). This study seeks to explore the gap in the literature related to why medical errors continue to occur despite having best practice strategies available. The information gained from this study will add to the patient safety literature on the reduction of medical errors.

Chapter 3 presents the qualitative grounded theory methodology used for this research study explaining the nurses' perception of their role and why medical errors are still occurring despite having evidence-based safety strategies. In the next chapter the research design, methodology, researcher role and procedures for recruitment and data collection are described.

Chapter 3: Research Method

Patient harm as a result of preventable medical errors is still occurring two decades after the 1999 IOM report *To Err Is Human* (IOM, 2000; James, 2013). The purpose of this qualitative grounded theory study was to examine nurses' perception of their role in patient safety and to explore nurses' perception of why medical errors occur despite the implementation of evidence-based safety strategies. This study was designed to develop a theory to understand why preventable medical errors are still occurring. This study offered insight into how medical errors can be reduced from the viewpoint of the registered nurse.

In this chapter, I describe my role as the researcher, the research design, and the study's methodology, including the data analysis plan. Chapter 3 includes a synopsis of my biases and assumptions, as well as my rationale for selecting the research design. Information related to issues of trustworthiness, including the study's credibility, dependability, confirmability, and transferability, is described. This chapter concludes with an overview of ethical procedures to meet the requirements set by the institutional review board (IRB).

Research Design and Rationale

The research questions explored for this study were the following: (a) What are the perceptions of nurses regarding their role in patient safety in a hospital setting? (b) What are the factors contributing to patient harm, despite the use of evidence-based safety strategies in the hospital setting from the nurses' perspective? and (c) Why are preventable medical error events still occurring from the nurses' perspective?

Central Phenomenon of the Study

The central phenomenon of the study was nurses' perception of their role in patient safety and nurses' perception of why medical errors are still occurring despite the use of evidence-based safety strategies.

Research Tradition

I chose the qualitative approach as the scientific method to gain an in-depth understanding of a phenomenon (see Grove et al., 2013; Sanjari, Bahramnezhad, Khoshnava, Shoghi, & Cheraghi, 2014). A qualitative inquiry occurs in the natural setting of the participants being studied (Patton, 2015). Exploration and descriptions are used to gain a deeper understanding of the lived experience or events (Grove et al., 2013). The five common qualitative research designs are phenomenology, case study, ethnography, narrative, and grounded theory (Creswell, 2013; Grove et al., 2013). Qualitative research is inductive, provides rich descriptions, and includes the researcher as the research instrument. Differences in qualitative designs pertain to the study's focus, data collection strategies, and analysis (Merriam & Tisdell, 2016).

Although various qualitative methods could have been used to conduct this study, grounded theory was most appropriate for the research questions being addressed. In a grounded theory study, a researcher goes beyond describing a phenomenon and formulates a theory explaining why something has occurred. The purpose of this study was to develop a theory explaining why medical errors are still occurring based on the views of the participants. Grounded theory was first introduced by Glaser and Strauss (1967). Grounded theory has been widely used in the disciplines of sociology,

psychology, and nursing because of its flexible approach and its theoretical beginnings in sociology (Grove et al., 2013; Hussein, Hirst, Salyers, & Osjui, 2014). Grounded theory involves an inductive process for data collection and analysis (Mills, Bonner, & Francis, 2006). According to Matua (2016), the fundamental principles of grounded theory and other qualitative methods are the same; however, there are major differences between the various schools of grounded theory. Differences in the grounded theory approaches are noted in the role of the researcher, coding, use of literature, and theory development (Matua, 2016).

For this study, other qualitative designs were considered, such as phenomenology and case study. Phenomenology focuses on participants' lived experiences (Creswell, 2013; Starks & Trinidad, 2007). In a phenomenological study, a researcher seeks to discover meaning of a phenomenon as experienced by the participants (Grove et al., 2013). The phenomenological study addresses the meaning behind the experience (Patton, 2015). Phenomenology was not chosen because my research was intended to generate a theory to explain how the nurse's role can help reduce medical errors. Phenomenology would have been useful in describing the lived experience of nurses caring for patients when medical errors are occurring, but it would not have addressed why they are occurring. Questions centering on what and how are best answered from a phenomenological approach (Creswell, 2013). Phenomenology was not the best design to answer the questions posed in this patient safety study.

Case study research provides description and analysis of a specific case or cases and focuses on a specific bounded system such as a process, event, or activity (Creswell,

2013; Jacelon & O'Dell, 2005; Merriam & Tisdell, 2016). I did examine a specific process or an event in patient safety. A case study approach did not align with the research questions. A case study approach would have addressed the phenomenon being explored but would not have addressed why medical errors are still occurring.

Ethnography was not chosen because that methodology centers on culture, which was not the scope of this study. Ethnographic research centers on cultural behavior (Grove et al., 2013; Merriam & Tisdell, 2016). In ethnographic studies, the goal is to understand the culture of the population being studied as opposed to making identified improvements about a phenomenon, which was the goal of this study.

Research narratives include stories from individuals to bring meaning to a phenomenon. The narrative inquiry centers on the analysis of stories told by participants. A story is a recollection of how the participants viewed an experience. The narrative approach would not have answered the research question of why medical errors are occurring. The goal of narrative research is to understand and analyze actual stories.

Rationale for Chosen Design

Grounded theory was the most appropriate design for my study for the following reasons. First, grounded theory research allows for the development of a theory. For this study, theory development was important to provide an understanding of why medical errors continue to occur from the nurses' perspective. Second, the interpretation of the participants' views on patient safety provided in-depth and rich perspectives informing strategies to reduce medical errors. Grounded theory offers a systematic approach to data analysis. Constant comparison and simultaneous collection and data analysis are achieved

with this research method. Third, grounded theory focuses on the why questions as opposed to the other qualitative methods that address what and how questions (Charmaz, 2014; Jacelon & O'Dell, 2005).

Within grounded theory, there are differing strategies that include the Glaserian version proposed by Glasser and Strauss, the Straussian version proposed by Strauss and Corbin, and the constructivist version proposed by Charmaz (Charmaz, 2014; Matua, 2016). Constructivist grounded theory aligned with the research questions, research problem, purpose, focus, and unit of analysis (see Charmaz, 2006). The classic grounded theory method was not chosen because it would have been difficult to develop a theory from the data without being influenced by theoretical assumptions I may have had about the topic of patient safety. Patient safety has been widely researched, so not having preconceived ideas about this topic was not possible.

Strauss and Corbin's grounded theory approach was not selected for this study because the Straussian approach involves a detailed step-by-step guide to data analysis. Strauss and Corbin (1990) proposed guidelines and procedures in grounded theory approach. There is considerable structure to the Straussian approach, and this rigid approach to data analysis did not align with the inductive approach of discovering why medical errors are still occurring.

In the constructivist view, neither data nor theories are discovered; theories are constructed by the researcher as a result of his or her interactions with the field and its participants (Charmaz, 2008; Mauta, 2016). The participants' and researcher's views are essential to the analysis of the information gathered (Charmaz, 2008).

Role of the Researcher

In grounded theory, the researcher is the instrument (Janesick, 2011; Miles, Huberman, & Saldana, 2014). For this study, I collected, coded, analyzed, and interpreted the data. I served as the facilitator in the focus group discussions. Part of my role included taking field notes, transcribing data, and highlighting key ideas or concepts gathered during the interviews. As the researcher, I upheld ethical standards as indicated by the IRB.

In preparation to be the research instrument, I completed the training course offered by the National Institute of Health (see Appendix D). I also completed the CITI training that was a requirement for my host site (see Appendix E). I also took an advanced course in qualitative research to develop my skills in interviewing, observing, and analyzing data. The assignments gave me the opportunity to learn techniques that were valuable in my role as the research instrument. Three major projects needed to be completed in the course. For example, I had to complete an observation exercise that was conducted in a public arena. This was the most challenging because I had to write field notes of my observations and share them with my classmates. Observing in public places can be distracting; however, I was able to use all of my senses during this observational exercise. I wrote a reflective paper highlighting my experience, including the challenges faced during this training. To add to my experience as a qualitative researcher, I attended qualitative research seminars during my academic residencies that outlined the role of the researcher in qualitative studies and how to conduct interviews. These seminars included important information on how to be organized in conducting interviews.

Personal and Professional Relationship With Study Participants

As the researcher, I had no personal or professional relationships with the participants in the study. At the time of this study, I was a registered nurse with over 15 years of critical care nursing experience who worked in the education department at a trauma facility. As a nurse educator, part of my role is to provide error-prevention training to staff to improve the safety culture. I am also the co-chair of the safety coach program at my facility. The safety coach program trains coaches on safety behaviors to prevent patient harm. I was instrumental in creating the safety coach program at my place of employment. I have not personally experienced a patient safety event with a patient. Because of the patient harm events experienced with my nursing colleagues, and as the nurse educator, I have been involved with root cause analysis discussions throughout my career.

Researcher Biases

Researchers use reflexivity to manage bias throughout a study (Johnson, 1997). The purpose of being reflexive is to take the time to be critically self-aware of potential biases that can exist (Mauthner & Doucet, 2003). The reflexivity process helps bring to the forefront any preconceived assumptions. Reflexivity captures the biases, values, and experiences that can shape the interpretations during a study (Charmaz, 2014; Creswell, 2013). After each focus group interview, I took the time to reflect on the experience and document it in my journal. Journal writing served as a way to collect my thoughts and feelings during the research process. Any biases and assumptions that I had were documented in a memoing journal as they emerged throughout the research process.

Ethical Issues

For the focus group participants, I provided a 5 dollar gift card was as an incentive. This incentive was highlighted in the recruitment advertisement. The incentives were intended to encourage participation and to promote the importance of the focus group discussion (see Krueger & Casey, 2015). To avoid possible conflicts of interest, I did not conduct the study in my current place of employment.

Methodology

Participant Population and Sampling Strategy

The study sample comprised registered nurses working in a Magnet designated hospital. A purposeful convenience sampling strategy was employed for participant recruitment. I selected registered nurses as the participants because they are at the bedside and interact with patients daily, and are in a unique position to provide insights into safety concerns. Nurses contribute to patient safety by ensuring safe handoffs of patient care, conducting nursing surveillance, managing patient risk, and balancing multiple roles (Cathro, 2016; Fasolino & Verdin, 2015; P. S. Groves et al., 2014; Groves et al., 2016; Kutney-Lee et al., 2009). The nurse's role includes being an effective communicator, patient advocate, care coordinator, and patient and family educator (Nadzam, 2009; Needleman & Hassmiller, 2009).

Participant Selection Criteria

Potential participants must have been practicing as a registered nurse (RN) for at least one year, work in either the acute care or critical care setting, and have worked in the facility and current unit for at least one year. The exclusion criteria include registered

nurses who have been hospitalized in the past six months or a nurse who was involved in a serious safety event in the past six months. Potential participants who are interested were instructed to contact myself the principal investigator. Participants that met the inclusion criteria signed an informed consent form prior to the implementation of the study.

Number of Participants and Rationale

For this study, focus group interviews were used as the data collection method. Recommended group size for a focus group ranges from 5 to10 participants (Krueger & Casey, 2015). In conducting a grounded theory study a sample size of 20 to 30 participants usually produces data saturation (Creswell, 2014). Through a focus group approach, sharing of ideas, feelings, and opinions is achieved as well as differing views. Data depth and theoretical saturation was achieved by conducting five focus group interviews.

Participant Recruitment

Various methods were used for recruitment for this study. I first started by communicating with the nurse scientist assigned to me who then communicated with the nurse leaders at their manager-director meetings to share the scope of the study. An electronic email was sent from the hospital internal email address to the staff and flyers were posted in the hospital break rooms with the approval of the managers (See Appendix B for email invitation to participate in the study and Appendix C for flyer advertisement).

Data Saturation and Sample Size

The sample size was dependent upon saturation of the data. Saturation was reached when there was no new information gathered from the data (Dworkin, 2012). Saturation of data also included when no new insights and theoretical categories aroused (Charmaz, 2006). For this study, the sample size was determined when no newer themes or codes were obtained (Fusch & Ness, 2015). It is suggested in grounded theory methods to utilize theoretical saturation as the sampling strategy (Charmaz, 2014; Creswell, 2013). Theoretical saturation is a method used in grounded theory to refine the categories in research.

Instrumentation

As the research instrument, I collected, coded, and analyzed the data. Focus group interviews were audio-taped and transcribed into manuscripts. Data collection instrument sources included memos, focus group interview protocols, audio tape, and flip charts. These sources of data were researcher produced. No historical or legal documents were used as a source of data collection instrumentation. I wrote memos during and after each focus group interview. My memos took into account the setting, interactions between the participants before, during, and after the interview. My memos also included any ideas that occurred to me during the interview. Field notes also include observations of the participants' verbal and non-verbal behavior. As far as the flip charts, at the end of the interview key themes and feedback was placed on the flip charts so that participants can visually see the major themes discussed. Interviews in grounded theory play a significant part in obtaining data (Charmaz, 2014; Creswell, 2013). The interview guide protocol and

the audio recorder are the tools that were used during this study to collect data. The interview guide consisted of open-ended questions. The purpose of the interview protocol was to systematically and consistently collect data during the interviews. I developed a script for both the beginning and the end of the interview and conveyed vital information such as the study purpose, ground rules, and confidentiality of everyone's identity, as recommended by Jacob and Furgerson (2012).

Researcher-Developed Instruments

The purpose of the interview was to gain insight into the study participants' perspectives about the phenomenon being researched. A semi-structured standardized interview protocol was created consisting of open-ended questions. See Appendix A for interview protocol. Demographic information of the study participants was taken at the beginning of the focus group interviews, See Appendix B for the email that was sent to the study participants to participate in the study.

Procedures for Recruitment, Participation, and Data Collection

For this study, information for data collection purposes occurred via focus group interviews. The participants were asked open-ended questions. The interviews lasted 60 minutes in duration. Prior to conducting the focus group interviews, informed consent was obtained from the study participants. In addition to obtaining informed consent at the start of all the focus group interviews, the participants were informed again of their voluntary participation, the study purpose, the length of the interview, and how the data are going to be used.

The participants were told that the interviews are being audio-recorded to ensure

the accuracy of the information shared. At the end of the focus group interviews, I gave a synopsis of key statements to ensure that the participants' thoughts were accurately represented. To ensure trustworthiness of the data, at the end of the interview I repeated back a summary of the participants' comments for verification of their thoughts (member checking), as proposed by Krueger and Casey (2015). Member checking is a strategy to validate respondent feedback. The purpose of member checking is so that the participants can verify their comments to clarify any areas of ambiguity, increasing the trustworthiness of the data. At the conclusion of the interview I closed with an ending question, asking each participant what they found to be the most important topic discussed. This feedback was placed on the flip chart in the room as a visual cue of the discussion. The participants were asked if there were any final thoughts or new insights gained after the completion of the interview.

I collected all the data. The interviews took place in a private conference room at the chosen facility. After each focus group interview, I documented my observations noted about the group dynamics and my thoughts that arose during the discussion. For transcription purposes, I transcribed the focus group interview verbatim. Each participant received a number to denote who was speaking. All field notes, memos, and audio recordings are kept in a secured locked drawer. All electronic files are password protected.

After data was collected I began to code the data. For grounded theory the coding process includes open, axial, and selective coding (Creswell, 2013; Matua, 2016). Open coding consists of categorizing segments of data from the interview. Open coding is a

method to start categorizing themes which are the focal point of developing a theory (Creswell, 2013). Axial coding is the process of creating subcategories that will contribute to the development of a theoretical model, focused on the central phenomenon (Creswell, 2013). In the selective coding process stage a visual portrayal, narrative statement, or propositional statements is created about the theory developed (Creswell, 2013).

Data Analysis Plan

The analysis plan strategy for this study involved memoing, coding, theoretical sampling, reflexivity, and comparative analysis. Memoing consists of documenting my reflections and thoughts during the data collection process. (Miles et al., 2014). My ideas were analyzed as they were being documented (Creswell, 2013). Memos are unique, for my thoughts were captured in real time and comparisons about the data are continuously explored (Charmaz, 2014). A memoing journal was kept throughout the study. Memos consisted of my personal views describing what went on in the field, and consisted of my thoughts related to the comparison of codes and categories. As proposed by Charmaz (2014) identifying gaps in analysis, sorting codes, and defining codes is part of memo writing.

I conducted the process of coding as Charmaz (2014) describes in her writings of "*Constructing Grounded Theory*". There are two phases to coding in grounded theory. First, there is the initial coding followed by focused coding (Charmaz, 2014). The purpose of coding is to define and understand the meaning of what is happening with the data (Charmaz, 2014). In the initial phase of coding, each word, line, or segment of the

data is being named; whereas the second phase of coding involves the synthesis and sorting of larger amounts of data (Charmaz, 2014). Therefore, I started my initial coding by reviewing the data obtained during the focus group interviews. I then read and then re-read the interview transcripts. I looked at each word, sentence, and paragraph and began to assign codes based on the data. The goal was to break down the data into smaller components.

Theoretical sampling is the process that entails gathering more information to refine categories in which no new themes emerge from the data (Charmaz, 2014). Theoretical sampling begins with collecting data, to initial coding, to analysis. Variation that is discovered in the categories is a result of theoretical sampling (Charmaz, 2014). Theoretical sampling is a strategy to determine what type of data is needed to be collected next. In theoretical sampling, I collected, coded, and analyzed the data (Merriam & Tisdell, 2016).

For theory development, being reflexive at all times is important when conducting qualitative research. For example, I shared my preconceptions and ideas about the study. Sharing my thoughts affords the reader an opportunity to understand how I reached conclusions and interpreted the data. Comparative analysis is the process of comparing data to the categories (Creswell, 2014). With this process, data is constantly being compared with one unit of data to another. With constant comparative methods, I compared the data for things that are similar and different (Charmaz, 2014).

Software Analysis

There are various computer-assisted qualitative data analysis software's (CAQDAS) that are available such as NVivo, ATLAS.ti, or MAXQDA (Lu and Shulman, 2008). The NVivo software was used for analysis purposes for this study. This software was chosen for its ability to sort and code data efficiently. For example, field notes and audio recordings of the participants can be converted into analyzable text by the NVivo software. Hutchinson, Johnston, and Breckon (2010) proposed that NVivo software package is appropriate software to use with grounded theory methods. I am familiar with the NVivo software from the qualitative research class taken at Walden University. It is during this course that I was responsible for entering data into the software for data analysis purposes. To refresh my knowledge, I took an introductory tutoring session with the Academic Skills Center (ASC) at Walden University to review the NVivo software. After data collection, I contacted the ASC again to work on the skills of managing, manipulating, and storing data.

Issues of Trustworthiness

Validity and reliability are addressed by examining factors associated with trustworthiness in this study. Credibility, dependability, transferability, and confirmability are examples of how to increase the trustworthiness of a study (Amankwaa, 2016; Connelly, 2016; Lincoln & Guba, 1985; Shenton, 2004). The following are examples of several techniques that were used to ensure data trustworthiness such as member-checking, purposeful sampling, audit trails, and peer debriefing, as outlined by Amankwaa (2016).

Credibility

Credibility was established by member-checking, peer debriefing and reflective journaling (Birt, Scott, Cavers, Campbell, & Walter, 2016; Connelly, 2016; Lincoln & Guba, 1985). Participant validation further added to this studies credibility (Cope, 2014). Member checking is a technique used to validate that the participants' views were articulated and reflected accurately. At the end of each focus group, the participants were asked to verify comments. Another process for member checking in this study included, returning synthesized themes to the participants with transcribed verbatim transcripts for the members to check for accuracy. Reflexive journaling was another technique used to ensure study credibility. I documented notes of my thoughts and interactions throughout the study. I used peer debriefing during this research process, in which I consulted with my dissertation committee to seek support and guidance. Receiving feedback from my committee in regards to my data collection methods, management, and analysis added to the studies credibility (Anney, 2015).

Transferability

To demonstrate transferability in this study, thick description and journaling techniques were employed (Amankwaa, 2016). Enough information such as providing detailed descriptions of the phenomena being investigated occurred so comparisons can be made to allow for the study to be replicated (Shenton, 2004). Details pertaining to the setting and the study findings were shared through a thick descriptive account of details. This will give the reader a visual picture of the events that occurred in conducting the research so that findings can be transferred (Amankwaa, 2016; Merriam & Tisdell, 2016).

Purposeful sampling is another way as suggested by Anney (2015) to ensure transferability of a study. For the selected participants can give in-depth knowledge about the subject matter being studied.

Dependability

To ensure dependability of the patient safety study, detailed information about how the study was conducted is provided in Chapter 4. An audit trail outlining the steps in the study was created (Lincoln and Guba, 1985). The audit trail is a log of events that took place. This audit trail provided information on how data was collected, categorized, analyzed and how decisions were made throughout the study (Merriam & Tisdell, 2016). A journal was kept highlighting pertinent information after an interview. The journal has detailed accounts of any major events that occurred during the study. The creation of a protocol listing dates and times of activities demonstrated dependability of the data, as proposed by Shenton (2004).

Confirmability

In this study, confirmability was determined by performing the technique of an audit trail and reflexive journaling (Amankwaa, 2016; Anney, 2015). The steps that were conducted in the study included how the study findings were derived and reported in the audit trail. In-depth information related to the data are seen in my field notes. Shenton (2004) shared that the use of diagrams and sharing the limitations or shortcomings in the study will add to this study's confirmability increasing the trustworthiness of the data obtained.

Intra and intercoder reliability

To determine intercoder reliability, two are more coders independently are in agreement with the codes established in a study (Campbell, Quincy, Osserman & Pedersen, 2013). For this study, I am the single coder and will use the intracoder reliability approach. Therefore, a consistent approach to coding of data will take place.

Ethical Procedures

Protecting the rights of the participants is paramount in this study. For the ethical protection of the participants, before any data was collected, approval from Walden University's Institutional Review Board (IRB) was obtained. Ethical guidelines provided from the online NIH Web-based training course "Protecting Human Research Participants" served as a guide for the ethical content for this study.

As in any study ethical issues can arise (Merriam & Tisdell, 2016). Therefore, the ethical issues checklist as outlined by Patton (2015) was followed. Ethical issues related to informed consent, confidentiality, reciprocity, power differentials, data collection, data analysis, and dissemination of the study findings can occur (Patton, 2015). In addressing these ethical concerns, it is important to note that this study did not take place in my place of employment. I did not have any direct contact with the study participants prior to data collection. Therefore, no conflict of interest or power differentials was a factor. Power differentials are important to consider, for the participant may feel indifferent to an authority figure and their power creating an unethical environment (Gibson et al., 2014; Raheim, Magnussen, Sekse, Lunde, Jacobsen, & Bystad, 2016). In obtaining participants'

informed consent I highlighted the participants' rights, the study purpose, the length, benefits/risk, and reasons for participant selection.

Ethical Concerns Related to Recruitment

In terms of recruitment, the participants were informed that their participation was strictly voluntary. The participants were informed about how the data in this study will be used. Confidentiality was maintained at all times. Information pertaining to informed consent and confidentiality was provided in advance of the interview as well as at the beginning of the interview (Patton, 2015). The anonymity of the participants were protected by assigning each person that participated an assigned number for coding purposes. The participants' identities remained anonymous for there aren't any identifiers on the record.

Ethical Concerns Related to Data Collection

The participants were informed that they can withdraw at any time during the study. The interviewees were not pushed to answer questions when they showed visible signs of discomfort. Ethical challenges did not need to be documented in this study. Any adverse event or general problem will be reported to the IRB immediately by submitting an adverse event form. However, nothing needed to be submitted for this study. An adverse event is described by The Office for Human Research Protections (OHRP) as any perceived negative experience during the data collection process.

Treatment of Data

Collected data such as informed consent is being kept in a locked cabinet. Data stored on the computer for this study is password protected. The IRB approval forms are

in a secured locked cabinet. Ethical advice would have been solicited from my committee chair and member if any ethical matters arose. Ethical advice did not need to be solicited. Per the Office for Human Research Protections (OHRP) Regulations, data should be retained at least three years after the completion of the research. However, for this study to be in alignment with Walden University IRB policy standards, the data will be retained for a period of five years after study completion. The research is considered completed when all research related interactions with the study participants are completed including all data collection and analysis. All paper records obtained during the research study was shredded. All material related to the research study that was on the computer's hard drive was removed. Data stored on USB ports and the tape the audio recorder was physically destroyed.

Summary

In summary, this chapter outlined the research design and rationale, my role as the researcher, the study methodology, data collection process, issues of trustworthiness, and ethical procedures. A qualitative grounded theory study was conducted to gain a deeper understanding into why medical errors are still occurring from the nurses' perspective despite having safety strategies available. This study consisted of 11 participants and the sample size was determined by saturation of the data obtained. Participants were asked open-ended questions. A standardized interview protocol was used to obtain data. The participants were purposefully recruited and confidentiality was maintained throughout the study as previously identified. Chapter 4 will provide a description and interpretative view of the study results.

Chapter 4: Results

The purpose of this qualitative constructivist grounded theory study was to develop a theory explaining why medical errors are still occurring in health care from the nurses' perspective despite having evidence-based safety strategies available. The perception of nurses regarding their role in patient safety and factors contributing to medical errors was explored. The research questions that guided this study were the following: (a) What are the perceptions of nurses regarding their role in patient safety in a hospital setting? (b) What factors are contributing to patient harm despite the use of evidence-based safety strategies in the hospital setting from the nurses' perspective? and (c) Why are preventable medical error events still occurring from the nurses' perspective? A theory was developed from the study results informing the understanding from the nurses' perspective about why medical errors continue to happen. In this chapter, I present the study setting, participant demographics, data collection methods, data analysis, evidence of trustworthiness, study results, and answers to the research questions.

Setting

This study was conducted at a Magnet 316-bed pediatric facility in the state of California. This hospital serves patients in both an inpatient and outpatient setting. All interviews were conducted in a private conference room at the hospital facility. There were no known personal conditions that influenced participants or their experience at the time of the study. At the time of the study's data collection, the organization was experiencing a critically high patient census level.

Participants were recruited via e-mail and through promotional flyers. The flyers were posted in the staff break rooms. Managers were updated at their managers' meetings by the hospitals' nurse scientist whom I have been working with, and they were encouraged to promote this research opportunity with their staff. Nursing leadership received a follow-up recruitment e-mail 1 week before the interviews as a reminder. I was assigned two nurses from the organization to assist with securing the interview rooms and to help post recruitment flyers throughout the organization.

Demographics

Informed consent was obtained and demographic information was collected at the start of each focus group interview. The inclusion criteria were nurses with more than 1 year of experience who currently practice at the bedside. Registered nurses from both day and night shift were represented. Nurses representing acute care and critical care participated in the interviews. There was a cross-section of nurses representing areas such as nursing transport, intensive care, oncology, medical-surgical, emergency room, and the float pool. All research participants were female nurses. Years of experience ranged from 3 years to 35 years. The ages of the nurse participants ranged from 20 years to 59 years. Eighteen percent of the nurses had their associates' degree and were in the process of completing their bachelors' in a few weeks. Fifty-four percent of the nurses were prepared at the bachelors' level, while 27% had their masters. See Table 1 for the demographic characteristics of the research participants.

Table 1

Participants Demographics

	Gender	Years of experience	Shift day/night	Degree	Age range	Unit
Nurse 1	Female	More than 5 but less than 10 years	Day Shift	BSN	31-40	Critical Care
Nurse 2	Female	More than 5 but less than 10 years	Day Shift	MSN	20-30	Acute Care
Nurse 3	Female	More than 5 but less than 10 years	Day Shift	BSN	31-40	Acute Care
Nurse 4	Female	More than 3 but less than 5 years	Night Shift	BSN	31-40	ED
Nurse 5	Female	More than 3 but less than 5 years	Night Shift	BSN	20-30	Acute Care
Nurse 6	Female	More than 10 years	Day Shift	ADN	51-60	Acute Care Float Pool
Nurse 7	Female	More than 10 years	Day Shift	ADN	41-50	Emergency Services Transport Team
Nurse 8	Female	More than 10 years	Day Shift	BSN	41-50	Acute Care
Nurse 9	Female	More than 10 years	Night Shift	MSN	41-50	Acute Care
Nurse 10	Female	More than 10 years	Night Shift	BSN	41-50	Acute Care
Nurse 11	Female	More than 10 years	Night Shift	MSN	41-50	Acute Care

Data Collection

After receiving IRB approval and before my data collection, I contacted the hospital research nurse scientist for permission to post recruitment flyers and to gain access to the hospital's e-mail account so that an e-mail could be sent out to the nurses. The nurse researcher sent out my recruitment e-mail to both the nursing staff and leadership staff on my behalf (See Appendix B). The recruitment flyer was approved by the site's public relations department before it was posted in the clinical areas of the hospital. The recruitment period was 4 weeks.

Participants contacted me directly via e-mail to secure their interview date and time. A week before each interview, the participants were sent a reminder e-mail. I conducted a total of five focus group interviews from February 6, 2018, to February 10, 2018. A total of 11 registered nurses participated in the focus group interviews with three no-shows. Each interview took from 35 to 90 minutes to complete with an average length of 54 minutes. At the start of each interview, I reviewed the study purpose, consent form, and demographic form. The participants were informed that the session would be audio recorded for documentation purposes and that their names would be de-identified in the transcripts. The nurse participants were thanked at the end of each interview and they received a 5 dollar gift card for participating. Each participant received a follow-up thank you e-mail for their participation 4 weeks after the interviews were conducted.

The data were collected using a Boocosa digital voice recorder. Notes were also taken during the interviews. After each interview, a memo was written capturing my thoughts and impressions of the interview. A standardized interview protocol was used at

each interview (see Appendix A). At the conclusion of each focus group, I summarized key points that were shared to validate participants' thoughts. After the interviews, the recordings were digitally transferred to my password-protected computer. After the audio transfer, I transcribed the tape. A copy of each focus group interview was saved in a Microsoft Word document on my password-protected computer. Analysis of the data was done throughout the data collection process. After seven interviews, there were no differences in the data being received from the participants. Therefore, further interviews were conducted to ensure that data saturation was achieved.

Regarding the original data collection plan presented in Chapter 3, I offered several interview sessions at various times as opposed to only in the morning. I intended for my focus groups to have more participants, but in each session there were a couple of no-shows. The participants received a 5-dollar gift card for their voluntary participation. There were no unusual circumstances encountered during data collection. In Chapter 3, I indicated that I would use NVivo to conduct data analysis, but the word clouds that were generated did not match or corroborate my findings as the researcher instrument. The word clouds displayed the most frequently used words visually, which was a benefit (see Cidell, 2010). However, the word clouds did not capture the words that the participants gave greater emphasis to and did not reflect the importance of certain phrases expressed during the interviews. Therefore, I went back to the interview tapes to listen to how the comments were made. I also reviewed the transcripts and did further analysis reexamining my codes and categories.

Data Analysis

I wrote memos throughout the data collection process to record my initial thoughts, possible questions, and ideas on the emerging data. The constant comparative method was used to analyze the data collected (see Charmaz, 2014). The interviews were transcribed verbatim prior to analysis in NVivo. I established the preset codes prior to the initial data collection process. The purpose of the preset codes was to determine the initial labels that I would use to sort and categorize my results. These codes consisted of words and short phrases. The preset codes I initially developed in relation to Research Question 1 on how nurses perceived their role in patient safety included *teacher* and *advocacy*. Other preset codes that indicated what the contributing factors to patient errors were included *lack of leadership involvement*, *lack of policy and procedures*, and *safety culture*. The preset codes in relationship to why medical errors are still occurring included *poor training*, *lack of education*, and *a decision/choice on the part of the nurse not to follow safety strategies*.

I transferred the recording of my first interview to my computer. From there I reviewed the transcripts of the first interview immediately and wrote down my initial impressions in my journal. I was able to transcribe my first interview and analyze it line by line and sentence by sentence to determine codes and categories prior to the second interview. The coding process, as suggested by Charmaz (2014), consisted of open coding after my first interview was conducted. I labeled words and phrases that were relevant. Relevancy was determined by repeated phrases, information that I found to be surprising, and anything that the interviewee specifically said was important (see

Charmaz, 2014). In the open coding process, I was able to identify codes that emerged from the data. My coding process included looking at both similar and differing themes in the transcripts. I then continued with a more focused coding approach. I examined items in the transcript that further intrigued me or what I considered unexpected during the interview. The preset codes were helpful to focus my analysis because after my first interview I came up with 30 initial codes.

Next, I began axial coding. I identified any relationships that existed among the codes that emerged from each of the interviews. This process took the longest. I reread the transcripts to determine relationships between one focus group interview and the next. Theoretical coding consisted of thinking about the direction of the study and what other questions I needed to ask to reach data saturation. I was able to do more focus coding by sorting the data into categories.

After the data were transcribed, I scheduled another appointment with a Walden qualitative tutor to review how to run queries and display my results with the NVivo software. Afterward, I uploaded the transcripts into NVivo Pro 11 for further analysis. I was able to sort my data, run queries, examine identified themes, and illustrate the results visually as a word cloud. As part of the coding process, both word and text frequencies were identified. For each research question being explored, I performed a query to identify themes that yielded a word cloud for the three research questions. Although the word clouds were able to be populated, I did not find much value in them, so I decided to go back to the data for further analysis. The word clouds highlighted the most frequently used words visually, which was beneficial to a degree. However, they did not capture

what words the interviewees placed the most emphasis on or what was important to the interviewee during the interviews. Although NVivo displayed my transcribed interviews, further analysis was needed.

Evidence of Trustworthiness

This study received IRB approval from both Walden University and the host site. My approval numbers were 02-02-18-0137527 and 1710120, respectively. Credibility, transferability, dependability, and confirmability were established and maintained throughout the data collection process.

Credibility

Credibility was achieved through respondent validation and triangulation. At the end of each focus group, I summarized my initial interpretation of what was said to validate the participants' views. I read back direct quotes and asked for further comments and clarification. Member checking helped me avoid misunderstanding or misinterpreting data. I read previous comments from the interview to see if the participants would corroborate their answers to questions.

Transferability

Transferability was achieved by providing thick descriptions of the participants' experiences shared during the focus group interviews, and by providing a detailed description of the setting and study conditions. Open-ended questions were asked of the participants and direct quotes were shared. Detailed accounts of the events, as well as my thoughts, were captured in my journal.

Dependability

Dependability was achieved by having an audit trail of the study events. Data were collected in a systematic fashion using an interview protocol. All interviews were audio recorded. After each interview, field notes were written to capture my initial impressions and thoughts. After I reread the interview transcripts, I wrote my initial impressions of the data. The results of the study included verbatim accounts of participants' views.

Confirmability

Confirmability was achieved from my audit trail and member checking. I gave a detailed account of how my data were collected, analyzed, and processed. I was able to provide a rationale as to why codes were merged based on my analysis. I kept a journal that was reflective of my thoughts all through the process starting with data recruitment, collection, and analysis. The journal provides an account as to why I made certain decisions during the research process. In my reflective journal, I wrote about my personal experience with patient safety and why this topic is so vitally important. Member checking was done after each interview where the main points were summarized and confirmed with the study participants.

Results

The participants were asked a total of ten interview questions related to their perception of patient safety. The following section highlights the study results in the participants own words. There were three research questions that were being explored in this study. Each of the three research question correlated with specific questions within

the interview protocol. Based on the results there were three major themes that resonated throughout each of the interviews. Themes centered on a technology, busy work environment, and human factors. The themes generated were in alignment with components of the SEIPS framework that was highlighted in Chapter 2.

Research Question 1

What are the perceptions of nurses regarding their role in patient safety in a hospital setting? The first research question corresponded with questions four and five of the interview protocol. The nurses were asked a series of questions about how they would describe their role in patient safety and describe how they felt they contributed to patient safety. The following is a list of codes that emerged from these questions; responsible, reliable, advocate, in charge, confidence, safety, attentive, observant, educator, and being relational. These codes helped formulate the following themes that centered on advocacy, attentiveness, and perceptiveness on the part of the nurse. The nurses responded to this question by stating the following:

- "You need to be an independent thinker" (Nurse 1).
- "We are the frontline, the guard dog, the advocate" (Nurse 2).
- "We are the protectors" (Nurse 3).
- "I see myself as a patient advocate, we are all patient advocates" (Nurse 4).
- "I'll say that, I feel proud or accomplished when my shift is over and my patient is safe. Sure I am here to cure and to care, but I'm here to keep them safe." (Nurse 5).

Nurse 5 reported the following:

I am the number one responsible person. I am the first place that anybody is going to look at and should look to ensure patient safety. I am responsible for making the plan to protect the patient, I'm responsible to carry out the plan to protect the patient, and I'm responsible to advocate safety for that patient if I think an unsafe practice is going on.

Nurse 8 reported the following:

I think our role in safety begins when we first see the patient. I don't see patient safety just centered on medication errors. Safety also includes family safety. Educating families on not letting their child stand on the chairs. When we bring them back in our area are they the right patient, are we talking to the family. Our role in patient safety is huge. Our eyes constantly have to be open.

- "I am the guardian" (Nurse 11).

The three themes that emerged from Research Question 1 included patient advocacy, protector, and the act of being vigilant.

Research Question 2

What factors are contributing to patient harm despite the use of evidence-based safety strategies in the hospital setting from the nurses' perspective? The second research question correlated with questions nine and ten of the interview protocol. These questions on the interview protocol centered on having the nurse describe barriers to patient safety as well as describing what would facilitate safe care practices. The nurses were also asked to identify from their perspective specific contributors to patient harm events. The following are a list of codes that emerged from the question of contributors to patient

harm events; communication, not following safety processes, patient load, nurse exhaustion, inconsistent practices, nurse behaviors, busy work environment and time constraints. These codes helped formulate the following themes centered on; work environment, workload, work demands, communication, and human factor of fatigue. The nurses responded to this question by stating the following:

- "Nurses can be set in their ways" (Nurse two).
- "Using the systems that are in place like barcoding, not overriding the systems we have in place" (Nurse three).
- "Communication. Communication between everybody. I see it everywhere on all levels. Between nurses and doctors, or nurse to nurse, during shift change or handoff" (Nurse four).

Nurse one reported the following:

A barrier to patient safety is communication. We need to be very open and clear with our communication especially on transport and probably anywhere else in the hospital. Clear communication whether it be in a code or just getting report can make everything run easier and safer.

Nurse five reported the following:

This is not a good time to ask that question. I just worked 17 hours on Friday. Our nursing supervisor just worked twenty hours twice in 7 days. We are in critical staffing. Nurses are overworked, EVS, RT's everyone is completely overworked. I think that is a significant contributor.

Nurse seven reported the following:

I have made a medication error before where I gave an antibiotic too fast. I was really busy at the time. We did not have scanning at the time. I wasn't following all of the right medication and right route processes. If you follow all of the rules that should not have happened. I gave it over a half an hour opposed to an hour. Everything was fine. But I was really really busy. I was a new nurse, I was real busy. I was happy it wasn't something horrible.

Nurse eight reported the following:

The culture of the unit. I think having an environment that is open, where everyone can talk about a mistake that is made is important. I don't feel like if I said to a nurse on my unit I made a mistake that they would be judgmental. I think they would be supportive. I think they totally will have my back and they would be supportive.

Nurse ten reported the following:

Like now, we have a lot of patients; we have high acuity we get a lot of floats who are not normally in our unit. From unit to unit we do report a little differently even though we have the same standardized tools and have the same icons on our computer system. Some people go and do a head to toe assessment and some go by systems or use a standard script they go by. It can vary. I know when I float to a different unit they give report differently; I have to think about how I'm giving report which takes me a little longer. I can see how I can miss some things by not giving report the same way.

Nurse eleven reported the following:

> I think there is always good and bad to every policy, every guidance and standards that we have. We have smart pumps and that's great but they malfunction, they don't have an actual brain. We have busy busy areas, busy shifts where we skip some steps. I think that in being busy that we may skip certain steps, or take shortcuts or rely on the pumps or rely on the previous nurse on whatever they tell us and not double check. I think when we do steps we just do it to get it done without putting thought into it and not checking. I think we get use to taking shortcuts. It's a dangerous thing. I think we all do it. It's the nature of the job for you don't have time to follow certain steps and we are all human.

After further analysis, the three themes that emerged from question two regarding contributing factors to patient harm events include; being busy, nurse exhaustion, and communication.

Research Question 3

Why are preventable medical error events still occurring from the nurses' perspective? The third research question correlated with question eight on the interview protocol. This question focused on the nurses' perception as to why errors are still occurring despite the use of available evidence-based safety strategies. The codes that emerged for this question included, technology dependent, shortcuts, fatigue, exhaustion, competing priorities, overwhelmed, overworked, no help, continuous motion, cloudy vision, technology resentment, unrealistic expectations, and not thinking. These codes lead to the formation of the following themes centered on technology, the work

environment, and human factors. The nurses responded to this question by stating the following:

- "When I give report to the newer nurses they don't know how to do the calculations they rely completely on the pump. Nurses are depending completely on technology" (Nurse one).

  Nurse two reported the following:

  I can think of it as for example I had a transplant patient. She was in DIC, had projectile poop, she is throwing up blood. I finally was able to give her medications. I was so focused on getting that drug in her I hung it on the wrong line. Sometimes you are really busy. It's not like I gave the wrong dose or med. I was just so focused on trying to get everything into her.

- "Taking shortcuts and not following the standard of care" (Nurse two).
- "Humans are not perfect we make mistakes" (Nurse three).
- "Experience, and education, when errors do happen it's because of the mix. You could have on one shift all new nurses with one senior staff- the skill mix" (Nurse one).

  Nurse four reported the following:

  It can be like a staffing crisis. I can't even delegate. Even the charge nurse has an assignment; we try not to do that. I know not to try to multitask because an error can happen. I'm trying to hang TPN and lipids and here come the two doctors trying to talk to me at the same time.

Nurse five reported the following:

If I won the lottery, I would love to change the ratio. We are spending millions of dollars on technology but we have added to the responsibility of what the nurse has to do in 12 hours but we have not reduced the load. If we had 3:1 ratio we could absolutely achieve what we need to do. You still have all this extra stuff that has drawn you away from the bedside and have put you in front of a computer. Gone are the days, that's all I'll say gone are the days.

- I see a lot of new nurses when I am trying to explain the math, they really don't understand how we came up with the numbers. They rely a lot on technology" (Nurse six).

Nurse seven reported the following:

I think people are not following those common error prevention tools. People are busy they get busy; they may not be taking it too seriously. I think people don't think about it. They are just working. They are not thinking about how serious it is what they are doing. It is different in oncology. I just see people busy and just working.

Nurse seven further stated:

It is not just nursing. Pharmacy mislabels things. I've seen that a few times. For example, doctors writing incorrect orders. One time a drug came from the pharmacy that was supposed to be a different color and I was supposed to give a different drug. I only questioned it because I knew it supposed to be a different drug based on my experience. We also do a lot of procedures in our unit and we

do timeouts. We have our oncology nurse practitioner who always does the timeout and then we have some physicians who would not."

Nurse eight reported the following:

We are human. I think part of us being rushed and that pressure being on us, I think that something is happening where nurses have to work extra, so many new grads, so many people trying to train people appropriately, there are travelers.

Nurse nine reported the following:

We are constantly pressed to move quicker work harder. Use more tasks that come up in our charting system. Ever so often people are like we are adding a new tool and it's really easy to use. Yet it's just another thing added. Yes, it may take 5 minutes but there are other tasks that have been added.

- We are human. We are not perfect. I wouldn't expect everyone to be perfect but I do expect everyone to give perfect care" (Nurse nine).

Nurse ten reported the following:

Right now we have such high acuity patients. I think that's when things start to slide a little when you don't have time. You have to start triaging. It is an opportunistic thing. There is greater opportunity for error when you are rushing and you have to choose which patient to ignore for a little while because you are focusing on the high acuity patient. That's when the opportunity for shortcuts happens. We go around the guardrails or safety checks because we are in a rush to care for that high acuity patient. I feel now that is happening a lot. You are almost

left with no choice or you won't see that patient. I am not saying that is what we do.

Nurse eleven reported the following:

The amount of work the nurses have. If the nurses had a less of load they can actually spend time with the patient. This way the nurse can see where the patient is lacking knowledge, we can communicate, educate, assess what the needs are for the patient and determine where to put our attention. The heavy loads, there is only so much you can do, the treatment has to be done in a timely manner and there is no way at times you can get to it during your shift. You become accustomed to taking shortcuts until something happens. I also don't think all of the doctors and nurses are communicating.

The three themes that emerged from question three regarding why medical errors continue to occur centered on technology, human factors of exhaustion, and a busy work environment. These themes were similar to the contributing factors identified in question two but with greater emphasis placed on technology.

Summary

In summary, the results of the study yielded three main categories as contributors to patient harm events that were similar to their explanation as to why medical errors are still occurring from the nurse's perspective. The categories were technology, busy work environments, and human factors. These categories are in alignment with components of the SEIPS model that was the framework used to organize the literature section and the study findings. The participants stressed how technology was the primary cause of

medical errors followed by having a busy work environment throughout the interviews. These themes were corroborated from one interview to the next with each of the study participants.

This chapter described the setting, participant demographics, data collection methods, data analysis, and the results of the study in narrative form with a summarization of the findings. Chapter 4 also included examples of the studies evidence of trustworthiness. Chapter 5 will further describe an interpretation of the study findings, study limitations, recommendations and implications for further research.

Chapter 5: Discussion, Conclusions, and Recommendations

Patient safety remains a serious concern in health care. Preventable medical errors continue to happen, and patients continue to be harmed in both pediatric and adult hospitals (Jacott, 2003; Makary & Daniel, 2016). Studies have indicated how serious safety events have decreased in hospitals that have adopted safety principles established by high-reliability organizations (Lyren, Brilli, Bird, Lashutak, & Meuthing, 2016). Although hospitals have improved their safety cultures by implementing safety huddles, using error-prevention training tools, instituting standardized checklists, and conducting bedside shift reports, safety events continue to occur that cause harm to patients (Boucher et al., 2012; Hales & Pronovost, 2006; McDonald et al., 2013).

The purpose of this qualitative grounded theory study was to generate a theory to explain nurses' perception of their role in patient safety and why errors are still occurring despite the implementation of evidence-based safety strategies. The grounded theory method presented by Charmaz (2014) was used to explore why preventable harm events are still reaching patients. This study was conducted to contribute to the existing patient safety literature on medical errors.

The three main themes identified in this study were technology, the work environment, and human factors. The results of this study were consistent with three of the work components of the SEIPS model. The SEIPS conceptual framework is a model used to explore patient safety by examining the work system and how it relates to processes and patient outcomes. The work system in the SEIPS model includes the following components: the person, tools and technology, environment, tasks, and the

organization (Carayon et al., 2006). This study confirmed that if there is a change in any part of the work system, such as technology, patient outcomes are impacted.

The nurses consistently described how being busy and under pressure with an increased workload in addition to the demands of technology influenced their behavior to bypass safety mechanisms. Nurses shared that errors are occurring because shortcuts are being taken. The shortcuts, as described by the nurses, are being done because of the demands that are being placed on nurses during their shift. This finding was consistent with the literature related to workarounds that nurses have created as well as the shortcuts nurses take to get their job completed (Debono et al., 2013). Based on the literature, workarounds impact patient safety because nurses are bypassing the necessary safety systems that have been instituted for the protection of patients. Medication barcode scanning is an identified safety strategy for which nurses have created a workaround (Koppel et al., 2008). Based on the results of this study, the bypass model theory emerged.

Interpretation of the Findings

The bypass model theory is not the same as workarounds or taking shortcuts, or normalized deviance. The bypass model theory (see Figure 1) was derived from the interview data indicating that the conditions nurses work under influence their behaviors to bypass safety systems. The results of this study extend knowledge as to why preventable harm continues to occur in health care from the nurses' perspective. Findings indicated that when nurses are working in a busy environment with the mounting demands of technology, they use shortcuts. Participants also reported that taking

shortcuts gets easier over time when errors are not detected or a harm event has not occurred. The human factor of feeling pressured, overwhelmed, or stressed has a fundamental influence on how nurses interact with the system that is meant to safeguard the patient.

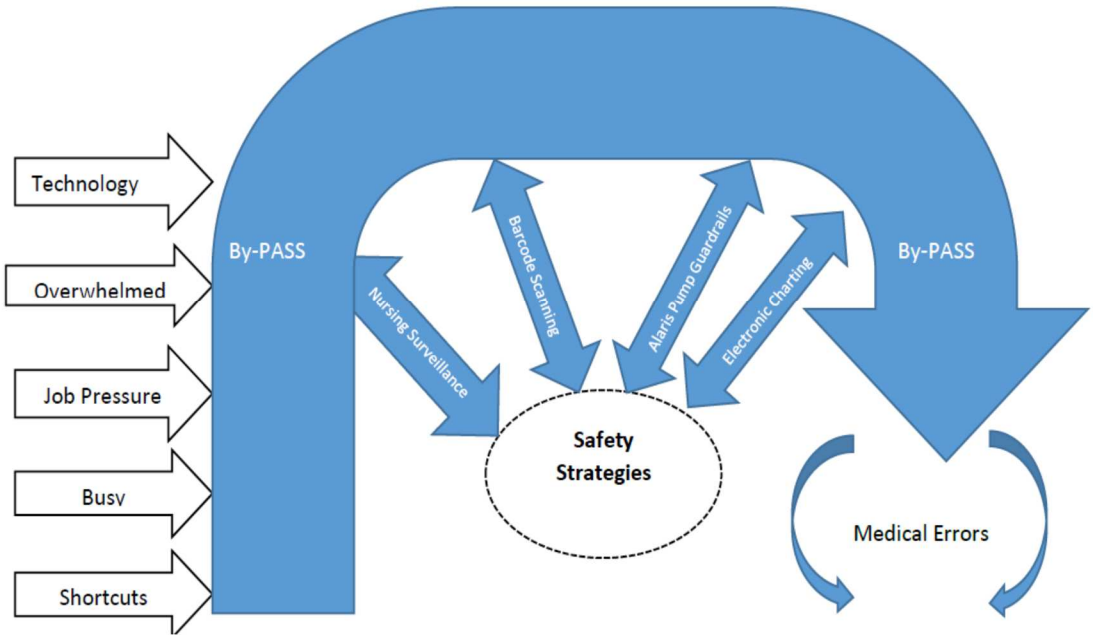

Figure 2. Bypass model theory.

Workarounds have been described as working around a process that does not fit into the workflow because of system failures (Barach & Phelps, 2013). Circumventing processes is considered a workaround (Pabst, 2013). Researchers also described this concept as normalized deviance, which occurs when a nonconventional practice becomes normal (Barach & Phelps, 2013). Normalized deviance is seen as an acceptable practice to deviate from the processes in place because of barriers impeding workflow (Price & Williams, 2018). The term *shortcut* is defined in the literature as finding a way to take the

least amount of time and not following all of the steps necessary to achieve a task (Beaulieu & Freeman, 2009; Pabst, 2013).

The SEIPS model provided structure and served as the framework for the study. Within the SEIPS model, there is the work system that consists of technology, tools, tasks, the environment, the organization, and the person at the center of the work system (Carayon et al., 2006). The first identified theme from the interviews centered on technology. The use of technology in health care has increased over the past 20 years (Korhonen, Nordman, & Eriksson, 2015). Certain technology in health care was designed to improve patient safety (Whipple et al., 2013). During the interviews, nurses spoke about how technology has, from their perspective, added to their workload. Nurses described how technology has decreased their time spent with patients. According to the nurses, technology has not reduced their work responsibility and has made their work more cumbersome.

Regarding the use of technology, nurses reported that the equipment varies and can include devices such as computerized charting, smart infusion pumps, and barcode scanners. Constant changes and upgrades are being made, and nurses are responsible for learning about them. One of the nurses stated "technology is taking away our ability to think." During the interviews, the comments regarding technology were overwhelmingly negative.

The study results confirmed how technology is viewed in the literature from nurses' perspective. Parente and McCullough (2009) conducted a systematic review of literature and found that health information technology has served as a hindrance to

patient safety. This finding contrasted with results from other systematic reviews associating improvements in patient safety with health information technology (Banger & Graber, 2015; Buntin, Burke, Hoaglin & Blumenthal, 2011). Some studies have shown improvements in physician order entry while other studies have indicated that health information technology has not had the desired outcome for nurses and has been seen as a dissatisfier (Sockolow, Liao, Chittams, & Bowles, 2012; Stevenson, Nilsson, Petersson, & Johansson, 2010). If the end user of technology is not satisfied with the product, this can impede safe care delivery (Buntin et al., 2011). Based on this study's findings if technology does not fit with the nurses' workflow, technology can be a dissatisfier and have an impact on patient safety A noted barrier to health information technology has been alert fatigue, which can lead to complacency among health care providers when alerts are overridden or ignored (Carspecken, Sharek, Longhurts, & Pageler, 2013).

Results from the current study were consistent with those from the literature regarding nurses' perception of technology. Nurses in the current study stated that they "click on the computer bypassing some of the alerts so they can do their job faster for they are pressed for time." The theme of technology resonated throughout the interviews. This raised concerns about what can be done to improve how nurses integrate technology into their daily workflow. Based on nurses' perception in the study, it does not appear that technology is helping.

Another noted theme in the study pertained to the work environment. The work environment is part of the SEIPS models work system (Carayon et al., 2006). The nurses in the current study described their work environment as being busy. The word *busy* was

frequently used throughout the interviews to describe how nurses felt about the conditions in which they were working. According to participants, being busy was leading to rushing on the job. Rushing and not paying attention to the alerts is a patient safety concern, and rushing can lead to a patient harm event (Ancker et al., 2017). This finding raised concerns about the work environment that the nurses are expected to function in while they are caring for patients. The nurses in this study focused on the workload of their patient assignments in their work environment. Other studies indicated that an increase in nurses' workload with mounting demands can have patient safety consequences (Nantsupawat, Nantsupawat, Kunaviktikul, Turale, & Poghosyan, 2016).

Human factors were the third identified theme regarding why preventable errors are still happening from the nurses' perspective. The study results confirmed the current literature on human factors as being significant contributors to nursing errors (Roth et al., 2015). Factors such as being overwhelmed, losing focus, and not thinking through steps were identified as causes of nursing errors (Roth et al., 2015). Humans are not infallible, so the likelihood of errors occurring will persist (La Pietra et al., 2005). Leaders are aware that people are human and can make mistakes; therefore, increasing the use of technology and improving work environments have been the center of attention to improve safety (Whipple et al., 2013).

Nurses in the current study revealed great pride as they responded to the question of how they viewed their role in patient safety. According to the SEIPS model, the nurse is the person at the center of the work system who interacts with all of the components that impact patient outcomes (Carayon et al., 2006). Nurse participants specified that

their role in patient safety was vital in keeping patients free from harm. The concept of being responsible resonated throughout each interview. The nurses articulated how they had the responsibility to continuously deliver safe care. The nurses described their role comfortably as being the patient advocate. Therefore, it was concerning that nurses would bypass safety mechanisms in place to protect the patient. According to the bypass model theory developed in the study, nurses are working in conditions that adversely influence their decision-making as they care for patients.

Limitations of the Study

This study was conducted at a single site pediatric hospital. Further studies may include participants from other Magnet pediatric facilities to compare nurses' perception of their role in patient safety and why medical errors are still occurring. Studies may also be conducted at an adult hospital to compare adult and pediatric nurses' perception of their role in patient safety. The nurses interviewed were all women, so it would have been beneficial to gather data from male nurse participants to see if their perspectives differed from their female colleagues. Although I interviewed bedside nurses, it would have been valuable to examine the perception of nurse leaders such as managers and directors to gather their viewpoint regarding why errors are still occurring. Findings from this study indicated why errors are still occurring from nurses' perspective, but the study did not address how to achieve zero preventable harm.

Recommendations

Technology is being used in high quantity and is in high demand in the current hospital setting. Technology is constantly changing (Shih & Rosenblum, 2017; Singh &

Sittig, 2016; Whipple et al., 2013). This change requires the bedside nurse to be proficient in this ever-changing system. The benefits of health information technology and its effects on health care providers need to be continuously evaluated. Nurses will need to be educated on upgrades and changes to technology as they are being made. Based on this study's findings nurses should be included in how the functionality of technology changes impact workflow. Further research is needed to examine the long-term impact of technology on workflow as changes are being made. Frontline staff nurses should be included in the design and upgrading of electronic systems to inform designers how nurses use and perceive the benefits of technology in their daily workflow. It would also be beneficial to examine perceptions of other health care providers because health information technology is continuously evolving (Shih & Rosenblum, 2017).

When it comes to the nurses working environment, it is imperative that nurse leaders find ways to design the work environment that is less busy. The redesign of the work environment will help nurses not feel rushed which leads to the nurse taking shortcuts resulting in mistakes. Adding more licensed personnel to the workforce can aid in the nurse delegating more tasks to unlicensed staff while the nurse is facilitating patient care. This study result supports other previous patient safety literature related to the work environment and its influence on patient care outcomes (Kieft, de Brouwer, Francke, & Dlnoij, 2014; Kirwan, Matthews, & Scott, 2013).

Human factors play a part in patient harm events (Eggerston, 2014). Human factors as identified by Eggerston (2014) such as fatigue, multitasking, and stress are characteristics that can be linked to medical errors. Therefore, it is critically important to

study how human factors have led to harm events and implement practices and or strategies for prevention purposes. The nurses' interaction with technology and the work environment influences safe patient care delivery. Sharing information with staff about how stress influences how care providers interact with these systems heightens awareness on how nurses respond in a high-stress situation.

There are many factors that make patient safety complex and some of the complexities are due to the multitude of disciplines that interact daily to care for patients safely. Conducting future studies incorporating the perspectives of pharmacist and physicians will further advance our understanding of why harm events are reaching the patient from a global perspective. Further research related to how nurse leaders perceive why medical errors continue to happen should be explored. In addition, nurses who work in the outpatient setting and long- term care facilities should share their perceptions as it relates to safety.

Implications

This study has offered new insights based on the nurses' perception as to why medical errors are still occurring. The information presented offers valuable information for nurse leaders on how to help reduce medical errors by creating environments that are not rushed and incorporating bedside nurses in the initial designs and upgrades of technology that impact their workflow. A continuous assessment of how nurses are interfacing with technology and their work environment is needed to improve patient safety efforts. The social change impact for this study can lead to reduction of medical

errors. This will help improve organizational safety culture and improve patient satisfaction.

Methodological, Theoretical, and/or Empirical Implications

It is difficult to assess why people do things merely from survey results so conducting a qualitative study to determine actions and beliefs are important (Trbovich & Griffin, 2016). Therefore, the methodology utilized in this study was beneficial in describing why medical errors are still occurring. The bedside nurse spends a significant amount of time with the patient and is in a strategic position to share their perspective on safety events.

Recommendations for Practice

This study contributes to the patient safety literature by sharing information on how nurses need to understand the conditions that can influence their decisions to bypass safety mechanisms. First, it is recommended that education sessions are provided to nurses regarding how their behavior choices and actions influence patient safety. Secondly, it is recommended based on this study's findings that nurse leaders shadow nurses at the bedside to see what they are experiencing in their daily work. For nurse leaders are in a unique position to hear the concerns of their staff and implement changes that remove barriers to patient safety. If nurse leaders can experience what nurses face daily they would have greater insight into how the work environment with the demands of technology presents a condition that influences the nurses to bypass safety strategies. As identified in this study, rushed working environments coupled with the demands of technology are factors that are serving as barriers to delivering safe efficient care.

Conclusion

In conclusion, patient safety is a shared responsibility of all healthcare personnel. The Bypass Theory provides a visual model of why medical errors are continuing to occur from the nurses' perspective. The Bypass Model theory illustrates the condition that nurses are working under that influences the unsafe practice behavior of bypassing established safety mechanisms. Eleven nurses participated in this study sharing their perspectives about medical errors. The results of this study correlate with the current literature on how patient safety is a complex problem. Patient safety requires a deeper analysis from health care providers to find ways to continue to decrease harm events. The study findings suggest further exploration of the perception of health IT on patient safety from the perspective all the providers including the respiratory therapist, pharmacist and physicians is needed.

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Appendix A: Focus Group Interview Protocol

Date: _____

Time: _____

Number of Participants: _____

Interviewer: Janeane Walker, MSN, RN, CPN, CCRN-K

Thank you for volunteering to participate in this focus group interview. My name is Janeane Walker and I will be the facilitator of our discussion. I am a Walden University PhD nursing student. Each of you has had a chance to sign our consent form indicating that this interview is confidential and that your consent to participate is voluntary. The interview will take 60 minutes to complete. As you can see there is a recorder in the room so that I don't miss any of your comments. You will see me occasionally writing notes as you are answering questions. I will ask several open-ended questions. The purpose of the grounded theory study is to examine the nurses' perception of their role in patient safety and to determine the nurses' perceptions regarding why errors are still occurring despite the implementation of safety strategies.

Ground Rules:

- *There are no wrong are right answers*
- *You don't have to agree with what people say but I ask that you respect each other by not speaking over another person for your comments are being recorded for analysis purposes.*
- *Talk to each other*
- *My role will be to ask questions and facilitate the discussion*
- *This would be an excellent time to silence your cell phones*

As you can see there are names cards placed on the table so that I can remember everyone's name. Each person has also been assigned a number and that is how I will identify you in the transcript. Let's find out some information, by going around the table. Just state your name, how long you have been a nurse and how long you have worked for your healthcare organization.

Opening questions:

1. What does it mean to keep patients safe?
2. How have you seen safety concerns addressed on the unit?
3. Tell me about a time when you witnessed unsafe work behaviors?
4. How would you describe your role as it relates to patient safety?

5. How do you feel as a nurse how you contribute to safety?
6. What strategies do you use to keep patients safe?
7. How have you been involved with safety at your unit or hospital level?
8. Why do you think errors are still occurring that reach the patient?
9. How would you describe a barrier to patient safety?
10. How would you describe what facilitates safe care practices?
11. Have you ever been a patient in the hospital and if yes what was that experience like?
12. Have you ever had a family member admitted to the hospital and what do you remember about that experience?

Ending question:

13. Of everything that you heard in this session is there anything that resonated with you during our time together?

Let me summarize some of the key things that I heard you say so that you can tell me whether I missed something:

_____
_____
_____

After the session complete the following:

- Prepare a Post Interview Summary of Key Points During the Interview:

_____
_____
_____

- Interviewers observations noted during interview:

_____
_____
_____

To do list:

- Get the tapes to transcribe immediately
- Review field notes
- Review Flip Chart
- Draw a diagram of the room or take a picture
- Compare and contrast results by categories of individual focus groups

Look for emerging themes by question and then overall

Appendix B: Recruitment Email

Dear Nursing Associate:

I am interested in learning your perspective about your role in patient safety. I am a doctoral student at Walden University and I would like your assistance as I work to complete my doctoral research study. I have received permission from the Hospital IRB to conduct my research on nurses' perceptions of patient safety. The IRB will serve as the IRB of record (approval number is 1710120).

The purpose of this research study is to understand the perception of the nurses' role as it relates to patient safety and why medical errors are still occurring despite the use of evidence-based safety strategies.

The benefit to participating in this study is to provide insight into why medical errors are still occurring and what role nurses play to safeguard patients. If you are a registered nurse (RN) for at least one year, work in either the acute care or critical care setting and have worked in the facility and current unit for a year, your participation is requested. If you have been hospitalized in the past six months or a nurse who was involved in a serious safety event in the past six months you are excluded from participating.

If you agree, I will send you a consent form for you to review and sign when you arrive for the interview. Involvement in the study will require no more than 60 minutes of your time. Each participant will be asked a series of questions in a focus group format. Your participation in the study is strictly voluntary and you can decide not to participate at any given time. You will receive a $5 dollar gift card for participating.

Please email me at Janeane.walker@waldenu.edu which day and time you would like to participate in the focus group interview.

February 7th at 08:00 or 14:00 Location - 2nd Floor Conference C 2nd Floor West
February 7th at 18:00 Location 1st Floor North Conference Room
February 8th at 08:00 or 18:00 Location 1st Floor North Conference Room
February 8th at 14:00 Location 2nd Floor Conference C 2nd Floor West
February 9th at 08:00 Location 2nd Floor Conference A 2nd Floor West
February 9th at 14:00 or 18:00 Location 1st Floor North Conference Room
February 10th at 08:00, 14:00 or 18:00 Location 1st Floor North Conference Room

Thank you for your consideration,

Many Thanks,

Janeane Walker
PhD Nursing Student

Appendix C: Recruitment Flyer

Looking for
Registered Nurses

The purpose of the grounded theory study is to examine the nurses' perception of their role in patient safety and to determine the nurses' perceptions regarding why errors are still occurring despite the implementation of safety strategies.

This is a voluntary study. Participation is expected to take 60 minutes. Registered nurses that have been hospitalized in the past six months or were involved in a serious safety event in the past six months are excluded.

Please consider participating in a focus group interview if you work in a clinical area and have at least 1 year of nursing experience.
$5 dollar gift card will be provided for your voluntary participation after the focus group interview!

Please email me at Janeane.walker@waldenu.edu which day and time you would like to participate in the focus group interview.

February 7th at 08:00 or 14:00 Location - 2nd Floor Conference C 2nd Floor West
February 7th at 18:00 Location 1st Floor North Conference Room
February 8th at 08:00 or 18:00 Location 1st Floor North Conference Room
February 8th at 14:00 Location 2nd Floor Conference C 2nd Floor West
February 9th at 08:00 Location 2nd Floor Conference A 2nd Floor West
February 9th at 14:00 or 18:00 Location 1st Floor North Conference Room
February 10th at 08:00, 14:00 or 18:00 Location 1st Floor North Conference Room

Appendix D: NIH Certificate

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Janeane Walker** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 06/10/2015.

Certification Number: 1771949.

Appendix E: CITI Certificate

CITI PROGRAM

Completion Date 09-Oct-2017
Expiration Date 08-Oct-2020
Record ID 24896658

This is to certify that:

Janeane Walker

Has completed the following CITI Program course:

Course in The Protection of Human Subjects (Curriculum Group)
Social and Behavioral Researchers (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Children's Hospital of Orange County

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w388d1eeb-8597-4132-b5e8-3fd292067772-24896658