TO REPORT OR NOT REPORT: A QUALITATIVE STUDY OF NURSES' DECISIONS IN ERROR REPORTING

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DEDICATION

This work is dedicated to my mother, whom I still miss every day.

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First, I am grateful to the nurses of the intensive care units, both those nurses with whom I spent time and those whom I interviewed. Thank you for allowing me to have a glimpse into your lives and to help complete this project.

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Amy R. Koehn

TO REPORT OR NOT REPORT: A QUALITATIVE STUDY OF NURSES' DECISIONS IN ERROR REPORTING

This qualitative study was successful in utilization of grounded theory methodology to ascertain nurses' decision-making processes following their awareness of having made a medical error, as well as how and/or if they corrected and reported the error. Significant literature documents the existence of medical errors; however, this unique study interviewed thirty nurses from adult intensive care units seeking to discover through a detailed interview process their individual stories and experiences, which were then analyzed for common themes. Common themes led to the development of a theoretical model of thought processes regarding error reporting when nurses made an error. Within this theoretical model are multiple processes that outline a shared, time-orientated sequence of events nurses encounter before, during, and after an error. One common theme was the error occurred during a busy day when they had been doing something unfamiliar. Each nurse expressed personal anguish at the realization she had made an error, she sought to understand why the error happened and what corrective action was needed. Whether the error was reported on or told about depended on each unit's expectation and what needed to be done to protect the patient. If there was no perceived patient harm, errors were not reported. Even for reported errors, no one followed-up with the nurses in this study. Nurses were left on their own to reflect on what had happened and to consider what could be done to prevent error recurrence. The overall

impact of the process of and the recovery from the error led to learning from the error that persisted throughout her nursing career. Findings from this study illuminate the unique viewpoint of licensed nurses' experiences with errors and have the potential to influence how the prevention of, notification about and resolution of errors are dealt with in the clinical setting. Further research is needed to answer multiple questions that will contribute to nursing knowledge about error reporting activities and the means to continue to improve error-reporting rates.

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Chapter One. Background of the Study

In 1999, the Institute of Medicine (IOM) released a report: To Err is Human: Building a Safer Health Care System. The report pushed the topics of medical errors and patient safety to the forefront of the American public's and healthcare providers' attention (Kohn, Corrigan, & Donaldson, 2000). Two independent studies provided the basis for that report. The first study, The Harvard Medical Practice Study (Brennen et al., 1991), estimated the number of adverse events discovered in a New York hospital in 1984 and identified which of those events resulted from medical negligence. Brennen et al. used data from more than 30,000 hospital records from which population estimates of medical injuries were calculated; those records demonstrated an occurrence of 1050 adverse events, or 3.7% of all hospitalizations. Negligence contributed to more than one-quarter (27.6% or 290) of those adverse events. Using weighted totals, estimated from the nearly 2.7 million patients discharged from hospitals in New York in 1984, Brennan et al. (1991) calculated that more than 98,000 hospital in-patients experienced adverse events.

In a second study in Colorado and Utah, Thomas et al. (1999) used the same methodology as the Harvard Medical Practice Study. They reviewed approximately 15,000 patient records from 1992 and found similar adverse event rates. Thomas et al. extrapolated those figures to 33.6 million admissions to hospitals per year in the United States, wherein an estimated 44,000 Americans died each year resulting from medical errors.

Historical Perspective on Patient Safety

Small and Barach (2002) noted inadvertent patient harm appeared as an infrequent topic in 20th Century medical journals, beginning as far back as Beecher and

Todd (1954). Recurrence for inadvertent patient harm continues in the literature even during the first decade of the 21st Century (Cohen et al. 2005; Cuschieri, 2006; Grasso, Rothschild, Jordan & Jayaram, 2005; Hicks & Becker, 2006; Hosford, 2008; Pronovost et al. 2006; Szekendi et al., 2006). Beecher and Todd (1954) published one of the first, seminal articles that compiled data from over 500,000 operative cases. Their five-year study followed ten surgical teams where they examined and assessed all deaths that occurred during the study. Through data analysis, Beecher and Todd (1954) concluded that death from anesthesia was of sufficient enormity to represent a public health problem.

Barker and McConnell (1962) demonstrated a medication error rate of sixteen errors per one-hundred doses of medication, which led to developing guidelines of conduct for medication error research. In a different study, Anonymous (1966) retrospectively compiled data about the use of halothane from 1959 to 1963; findings from that study associated halothane with hepatic necrosis in post-operative patients. In another related study, Moses and Mosteller (1968) discovered a coincidental finding that revealed a large difference in post-operative mortality rates between the participating institutions. After adjusting the institutions' death rates for standard variables, evidence showed a significant disparity in institutional death rates could not be accounted for by either data taken in the study or sampling error. Moses and Mosteller stated that these findings present "important and delicate questions which must be faced" (p. 152) which should be pursued by "quiet [and] unofficial" (p. 152) means. The concept that personal performance, including that of physicians and other personnel, may have affected the findings is implied but never directly stated. Sanazaro and Williamson (1970) modified

the critical incident technique outlined by Flanagan (1954) to study physician performance. Sanazaro and Williamson (1970) defined a critical incident as "any episode of patient care in which one or more specific actions by a physician had one or more specific beneficial or detrimental effects on a patient" (p. 299). These actions correlated with patient statistics such as frequency of complaints, medical conditions, and amount of healthcare resources utilized. Sanazaro & Williamson (1970) determined that the frequency of effective and ineffective performances was proportional to these characteristics. In other words, the more characteristics a patient had (i.e., the more complex), the more likely the physician was to experience detrimental effects in the care of that patient. These findings were consistent with other, contemporary studies, which demonstrated that effective and ineffective performances were randomly distributed and could not be related to a particular age or sex distribution. This instance was the first time systems analyses were applied from a broader perspective than the care or aptitude of one individual.

Over the next two decades (1970s and 1980s), evidence continued to accumulate that pointed to adverse events among patients, including medical injury (Brennan et al., 1991). During the 1970s and 1980s, a sharp increase occurred in the number of and size of payments for medical malpractice claims, causing what was termed a medical malpractice crisis. In response to that sudden spike in malpractice claims, both healthcare organizations and the insurance companies expended great efforts to explain the underlying cause for the spike in reporting adverse events and medical injuries. However, no agreement could be reached about a common definition of the problem. Although legislation was passed in an attempt to change the laws that governed medical

malpractice, failure to define the problem clearly in the legislation only increased insurance company regulations and added to the laws that mandated changes in provider behavior. Laws were created to affect the frequency and severity of malpractice claims (Cassirer & Anderson, 2004). Despite these efforts, data collected after those laws were implemented offered little evidence the legislative changes affected the primary problem: medical errors (Kinney, 1995).

Response to the Institute of Medicine Report

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has been accrediting hospitals in the United States since 1951 (The Joint Commission, 2011). After the publication of the IOM report, JCAHO revised its organizational mission to one of improving both safety and quality of care provided. JCAHO supported the creation of voluntary and mandatory national error reporting systems. Subsequent standards were developed and published in JCAHO manuals, which called for integration of an organizational-wide safety program that encompassed any safety-related activity within the organization. JCAHO challenged organizations' managements to support and to encourage recognition of risks to patient safety and a focus on systemic issues, not individuals, when errors occurred (Poniatowski, 2004).

The Agency for Healthcare Research and Quality (AHRQ) considers the concepts of organizational focus on systemic issues regarding safety as part of what comprises a safety culture. A safety culture is a dedication toward safe care that pervades all levels of an organization. The safety culture is one wherein the institution models or promotes a blame-free environment in which any individual is able to report an error without fear of punishment (National Patient Safety Foundation, 2010). The literature is replete with

studies about how healthcare systems have sought to change their safety culture though purposeful methods (Cohen et al., 2004; Ginsburg, Norton, Casebeer, & Lewis, 2005; Thomas, Sexton, Neilands, Frankel, & Helmreich, 2005). However, changes in a safety culture resulting from specific interventions are difficult to study because healthcare systems are complex and nonlinear in nature.

Complex Adaptive Systems

In contrast to a linear system, the components of a nonlinear system are interactive and interdependent. A primary example of a nonlinear system is a complex adaptive system (CAS) (Zimmerman, Lindberg, & Plsek, 1998). A system is a set of connected or interdependent things. Complexity implies diversity with a great variety of connections possible between different sets of elements. The term adaptive implies the ability to alter and/or to change and to learn from experience (Zimmerman, et al., 1998). The elements in complex adaptive systems (CASs) are independent agents following rules of the system, rules that are flexible and subject to outside influences. Information and actions flow in both directions rather than in a one-way, linear fashion (Zimmerman et al., 1998). Unpredictability in a CAS stems from the fact that unanticipated forces can have unanticipated and erratic effects on a system. Historically, as CASs evolve, previous experiences are expounded upon as new events happen, and these can and do affect future outcomes (Zimmerman et al., 1998). CASs are often enmeshed in other CASs. In other words, an individual agent is a system unto itself even though the system remains connected to an agent of a larger system. As an example, a nurse is a CAS in and of him/herself, but also an agent in the department in which s/he works. The department is a

CAS as well as an agent of the healthcare organization. The healthcare organization is a CAS and an agent of the system of society. The interactions between CASs and the agents of a system are reciprocal.

Nursing in a complex adaptive system. Licensed nurses (registered nurses [RNs] and licensed practical nurses [LPNs]) and unlicensed nursing assistants (UNAs) comprise fifty-four percent of all healthcare workers in the United States (Page, 2004). As such, nurses represent a large number of independent agents, or CASs, found in hospitals; therefore, the work environment of nursing is a prime concern when studying safety culture (Clancy & Delaney, 2005; Page, 2004). Page stated that the processes of patient care affect the nurse as a CAS. Examples of processes that link CASs in healthcare settings are such things as patient admission, patient assessment, and treatments that include medication administration, ongoing patient evaluation, education, and documentation. Nurses are the one common link between these processes and are at the forefront to identify changes or gaps in these processes (Page, 2004). Reason (2000) stated that interconnected human and non-human system elements must operate in cooperation in order to achieve the goal of safe patient care. When processes in a system are changed, the likelihood of error also changes. Errors typically originate from multiple points within a system. When multiple points converge to impair a system's operation, an error is likely to result.

Page (2004) stated that nurses are well positioned to monitor and affect how the healthcare system functions across many aspects of patient care and thereby well positioned to notice and to respond to threats to patient safety. The typical work environment of nurses is characterized by multiple serious threats to patient safety, which

categorize into four basic components found in all organizations: (1) organizational management practices, (2) workforce deployment practices (3) work design, and (4) organizational culture (Page, 2004). Page also stated that nurses are the healthcare professionals with whom patients spend the most time. When a patient experiences an error, nurses are most likely the ones to be able to intervene prior to the error occurring, to be the first to note its occurrence, or be able to manage any after-effects that occur as a result. Kahn et al. (1990) and later, Mitchell and Shortell (1997) noted that nursing care activities, including ongoing monitoring of patients' statuses, are directly related to better outcomes for the patients. When nurses notice or are involved in an error, their follow-up action may involve a decision of whether or not to make a formal report of the error.

Error Reporting

Error reporting rates are linked to the culture of a healthcare organization and the fear of blame and reprisal that nurses harbor (Pizzi, Goldfarb & Nash, 2001). Studies reported reasons for not reporting errors include: concern for personal and legal culpability, perception of reporting by peers, fear of consequences such as blame and appearing incompetent, and reprimands from physicians (Ahern & McDonald, 2002; Ashcroft, Morecroft, Parker, & Noyce, 2006; Attree, 2007; Jeffe et al., 2004; Meurier, Vincent & Parmar, 1997; Stratton, Blegen, Pepper, & Vaughn, 2004; Taylor et al, 2004; Uribe et al., 2002).

Error reporting in a safety culture. The IOM report To Err is Human (Kohn et al., 2000) publicized the need for healthcare institutions to become safety cultures. The IOM consortium offered several recommendations for improving patient safety (see

Appendix A for a summation of these recommendations). One of the recommendations is: "The development of voluntary reporting efforts should be encouraged" (Kohn et al., 2000, p. 9).

Early patient safety research focused on identifying and categorizing types of errors found in the institutions' formal reporting systems. These classifications provided direction for focus on improvement efforts of the safety culture; however, based on a flawed system of error reporting, a fault lay in the findings from these descriptive studies (Stratton et al., 2004). Existing error reporting systems of many healthcare institutions were antiquated, cumbersome, and generally user-unfriendly (Ashcroft et al., 2006). Without an adequate means to track these flaws and other weaknesses in the system, existing error reports provide a limited view of a structure of health care and its potential pitfalls.

In order to identify flaws and weaknesses in the system, error reports must be submitted to the institution's formal reporting system. This study will address an initial step in the process of error reporting, that of the nurse's decision to report the error.

Purpose of the Study

The purpose of this study is to explore licensed nurses' decision-making processes regarding reporting when they believe they have made, witnessed, or have knowledge of an error. Understanding these decision-making processes is important because they determine the types and frequencies of errors reported; hence, the focus on and resource allocation of interventions to improve patient safety. By increasing the accuracy and the frequency of error reporting, organizations are better able to intervene

and to improve or redesign systems to provide safer care to patients (Kohn, et al., 2000). Findings from this study will be used to guide future studies of and interventions to promote error reporting.

Significance of the Study

In 2000, the IOM called for a fifty percent reduction in medical errors within five years; however, this decrease in medical error rates has been slow to develop despite multiple agencies' attempts at interventions (Leape et al., 2009). Accruing data demonstrating a decrease in medical errors has been problematic (Pronovost, Miller & Watcher, 2006b), and a contributing factor to the problem of lack of data is the inability to assess and ensure systematic reporting of errors (AHRQ, 2010; Pronovost et al., 2006b). The problem of error reporting was selected for study because the literature suggests that progress cannot be made in patient safety until accurate error reporting becomes routine; otherwise, healthcare providers will continue to labor under false assumptions about errors, their existence, and their causes (Kohn et al., 2000). A better understanding of licensed nurses' decision-making processes regarding error reporting will contribute to efforts to improve reporting accuracy and frequency. Additionally, accurate error reporting provides a database to measure whether any improvement was achieved though the intervention.

Definitions of Terms

For purposes of this study, the following terms are defined as listed.

Adverse event: "… an injury caused by medical management rather than the underlying condition of the patient" (Kohn et al., 2000, p. 28).

Error: "…the failure of a planned action to be completed as intended (i.e., error of execution) or the use of a wrong plan to achieve an aim (i.e., error of planning)" (Kohn et al., 2000, p. 28).

Harm: "…death or impairment of a body function or structure requiring intervention" (Agency for Healthcare Research and Quality, 2003).

Incident: "…occurrences that are significant or pivotal, in either a desirable or an undesirable way … significant or pivotal means that there was significant potential for harm (or actual harm), but also that the event has the potential to reveal important hazards in the organization [and] provide valuable opportunities to learn about individual and organizational factors that can be remedied to prevent similar incidents in the future" (Agency for Healthcare Research and Quality, 2008).

Incident reporting: "…a process used to document occurrences that are not consistent with routine hospital operation or patient care" (National Patient Safety Foundation (NPSF), 1997).

Licensed nurse: "an individual licensed by a state to perform nursing duties [and includes] both registered nurses (RNs) and licensed practical or vocational nurses (LPNs or LVNs)" (Page, 2004, p. 31).

Medical (refers to any healthcare provider) **error**: a "…mistake made in the process of care that results in or has the potential to result in harm to patients. … [A medical error can] include the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim [and] can be the result of an action that is taken (error of commission) or an action that is not taken (error of omission)" (Agency for Healthcare Research and Quality, 2003).

Patient safety: (as defined by the IOM) is "…freedom from accidental injury; ensuring patient safety involves the establishment of operational systems and processes that minimize the likelihood of errors and maximize the likelihood of intercepting them when they occur" (Kohn et al., 2000, p. 211).

Safety culture: an organization (as described by the literature) that "shares a constant commitment to safety … which permeates the entire organization … noted components include: 1) acknowledgment of the high risk, error-prone nature of an organization's activities, 2) blame-free environment where individuals are able to report errors or close calls without punishment, 3) expectation of collaboration across ranks to seek solutions to vulnerabilities, and 4) willingness on the part of the organization to direct resources to address safety concerns" (Pizzi et al., 2001, p. 447).

Sentinel events: are "…an unexpected occurrence or variation involving death or serious physical or psychological injury or the risk thereof" (Kohn et al., 2000, p. 93).

System: a "…set of interdependent elements interacting to achieve a common aim. These elements may be both human and non-human (equipment, technologies, etc.)" (Kohn et al., 2000, p. 211)

A Qualitative Study of the Problem

The study of the phenomena of licensed nurses' decision-making processes using qualitative methods is appropriate as these methods allow the researcher to reach into the decision-making experience of the nurses. The purpose of qualitative methods is to discover, rather than to test variables or interventions (Corbin & Strauss, 2008). The purpose of a grounded theory approach is to explore relationships and conceptually define processes as they apply to each other and to the social network in which they

occur. The focus of this study is to explore the interactions of individuals with an emphasis upon identifying the multiple perspectives involved within a specific event. Therefore, the situational perceptions of participants could provide the data required to explore possible interpretations (Corbin & Strauss, 2008). The qualitative approach for this study was to examine the problem from a constructivist-interpretive paradigm, the concept of which is more fully explored in Chapter III.

Research Question

The following research question guided my dissertation: What are licensed nurses' decision-making processes regarding reporting when they believe they have made, witnessed, or have knowledge of an error?

Limitations

The study has the following limitation: The results from interviews with intensive care nurses could not be widely applied to members of other health care disciplines.

Assumptions

This study included the following assumptions: (a) spending time with the nursing staff prior to beginning the recruitment process would build a relationship of trust that would encourage recruitment into the study; and (b) interviewees would honestly answer the questions posed by the interviewer.

Organization of the Study

This research study is presented in five chapters. Chapter One includes the background of the study, the purpose and significance of the study, a statement of the research problem including definitions of terms to be used, and the limitations and assumptions made in this study. Chapter Two presents a review of the literature, which

includes regulatory approaches to error reporting as well as a discussion of the effects of system theory and healthcare culture on error reporting. Chapter Three describes the methodology used for this research study beginning with a discussion of the principles of grounded theory research, which is then followed by the specific application of those principles and methods as they were applied to the selection of sampling, data collection, and data analysis. Chapter Four presents the results of the data analysis and describes the development of the five higher-order categories which make-up the theoretical model, Learning Lessons from the Error. Finally, Chapter Five presents a summary of the study, discussion of the findings, implications for practice, recommendations for further research, and the conclusion of the study.

Chapter Two. Review of literature

This chapter provides a comprehensive review of the literature that is foundational to the current study. The chapter is divided into three main sections: 1) a review of the literature regarding regulatory approaches to error reporting; (2) a system theory-based study in nursing and its application to error reporting; and (3) the effects of the health culture, specifically the safety culture, and its impact on error reporting. These sections contain summary statements and implications for this current research project.

Regulatory Approaches to Error Reporting

As an issue of public policy, medical errors first gained public attention during the 'malpractice crises' of the 1970's, which brought national focus upon poor outcomes from surgical operations (Alfredsdottir & Bjornsdottir, 2008). During that decade, the American College of Surgeons published the first-ever patient safety manual, and the American Society of Anesthesiologists dedicated research efforts to improve outcomes associated with anesthesia administration. Both of these organizations' efforts signaled a significant move towards improving peri-operative care (Loeb & O'Leary, 2004).

Mills (1978) was one of the first to study outcomes of medical errors; however, outcomes were guised in the phrase "disabilities resulting from healthcare management" (p. 360). The study was clear in its purpose; to develop classifications, nomenclature, and evaluation techniques that were used in 'patient compensation programs' by insurance companies. The author labeled the items of interest as 'potentially compensable events' or PCEs. Mills reviewed 1,974 charts and discovered 970 PCEs. Mills further analyzed PCEs by including the potential lawsuit value and evaluating the means by which

insurance companies could minimize potential compensations. Among the identified PCE causative factors, only 1.6% of them were attributed to nursing.

In 1999, the IOM released a report, To Err is Human: Building a Safer Health Care System. This IOM report brought the topics of patient safety and medical errors to the forefront among healthcare providers' collective attention. This report was a first of its kind, initiated by the IOM, which participated in the Quality of Health Care in America Project. Medical errors were chosen for the first report because of the number of risks to patients by injury, suffering, and/or death from medical errors (Kohn et al., 2000). In the final analysis, researchers estimated 44,000 to 98,000 patients in hospitals nation-wide had experienced adverse events (Kohn et al., 2000). Deaths by medical error were estimated to exceed the number attributed to motor vehicle accidents, breast cancer, or acquired immune deficiency syndrome (AIDS) (Regenstein, 2004).

After the publication of the IOM report, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) revised its organizational mission to focus on continuously improving both safety and quality of care provided to the public. JCAHO then defined a position statement on reporting and managing medical errors that supported the development of both mandatory and voluntary reporting systems (Poniatowski, 2004). Healthcare leaders recognized the difficulty in obtaining an accurate count of deaths or injuries attributable directly or indirectly to medical error because of legal, cultural, and administrative barriers that would resist reporting errors (Loeb & O'Leary, 2004).

An important stride toward increasing error-reporting rates was accomplished when President George W. Bush signed the Patient Safety and Quality Improvement Act

of 2005. The goal of the act was "to improve patient safety by encouraging voluntary and confidential reporting of events that adversely affect patients" (AHRQ, 2008). This legislation prompted the creation of patient safety organizations (PSOs) and provided federal legal confidentiality protection to information assembled by PSOs. The legislation also severely limited the use of this information in criminal, civil, and administrative actions. The goal of the PSOs was to identify a pattern of failures by studying and analyzing patient safety information from a large number of error reports from a diverse audience. Threats to patient safety could then be identified and followed by an intervention on a grander scale to eliminate risks to all patients (Clancy, 2008).

Essential to the process of gathering information is the need for timely and accurate reports by healthcare providers. Studies (e.g., Cook, Hoas, Guttmannova & Joyner, 2004; Espin, Lingard, Baker, & Regehr, 2006; Osmon et al., 2004; Rowin et al., 2008; Uribe et al., 2002) revealed that nurses are the primary reporters of adverse events; however, many nurses continue to harbor fears about reporting. Complete information given to PSOs by licensed nurses is critical to the accuracy and dependability of patient safety databases. Currently, a large gap in the literature exists regarding two areas of medical errors that licensed nurses need addressed. 1) What is important to report? 2) Which actions are reportable? For these two points, understanding ways to encourage nurses to make accurate reports about medical errors is important.

A History of Name, Blame, and Shame

When confronted with human mistakes, two options exist: one is to remove the flawed human; the other, fundamentally alter the structure and expectations of the system in which that human operates. Historically, health care has always chosen the former

(Nance, 2004). The reaction of laying individual blame following a medical error is an instinctive and understandable response (Loeb & O'Leary, 2004). The process of identifying the guilty party, exerting punishment, and providing compensation to the injured party is a culturally ingrained procedure in Americans' lives (Agency for Healthcare Research and Quality (AHRQ), 2003). American society is governed by the belief that legal redress is appropriate for all problems. Following any adverse event, the traditional response by an authority is to blame the individual perceived to be responsible. Such an approach results in enormous personal cost to the individual concerned and does little to address the root cause of error; thus, recurrence is not prevented (Ottewill, 2003) Unfortunately, name, blame, and shame have demonstrated little effect on preventing future occurrences of the same or similar events (Loeb & O'Leary, 2004).

Historical belief states that by ridding the system of the human who commits the error, the system is able to maintain the façade of normalcy and infallibility. "The system could thus proclaim that the expectation of human perfection was still valid, but that the system's only mistake was picking the wrong human" (Nance, 2004, p. 191). More recently, a systems approach to error framework recognized that human error is inevitable; therefore, systems need to be developed that recognize the inevitability of human error. Although this particular systems approach to error has been successful, sustaining success necessitates a cultural shift (Ottewill, 2003).

Education as a cultural change agent. One dynamic of the culture of health care is education. Healthcare professionals are educated in a model that emphasizes the ability of an individual to control and determine clinical outcomes (Nance, 2004). By following the teachings of "egocentricity" (Nance, 2004), the culture of health care reflects and

amplifies pervasive attitudes of individuality. Accordingly, the only one in the system who is accountable for things going wrong is the individual. Therefore, when an error does occur within a healthcare setting, the professional most directly involved is perceived as the cause (Loeb & O'Leary, 2004).

Among the challenges involved in achieving improvements in patient safety, a need exists for major alterations in the educational preparation of healthcare professional students (National Patient Safety Foundation [NPSF], 2010). Donald Berwick, previous director of Medicare and Medicaid services, criticized the health care system and its poor response to error management, when he stated, "their [health care systems'] theories of cause often remain scientifically Neanderthal" (Berwick, 2003, p. 2571). According to Berwick, healthcare institutions continue to cling to historic beliefs: that bad people cause bad errors, that retrospection will allow them to find a single root cause, and that adding complexity improves reliability. Healthcare institutions also believe that human errors are inevitable, thus injuries to patients are also inevitable (Berwick, 2003). Berwick supports a paradigm shift away from focus on the individual and instead on the system in which the individual works (Berwick, 2003).

System Theory

System theory describes a strategy, which other industries have used successfully to deal with the problem of human fallibility. To reduce errors, system theory focuses on designing systems to decrease the likelihood of error and to minimize focus on identifying the person or persons responsible (Regenstein, 2004). Studies of systems in health care are found in the nursing literature (Anderson & Webster, 2001; Bartels &

Bednash, 2005; Benner et al. 2002; Clancy & Delaney, 2005; Deutschendorf, 2003; Holden, 2005; Rowe & Hogarth, 2005; Viney, Batcheller, Houston, & Belcik, 2006).

System theory-based study in nursing. One example of a system theory-based study is Meurier (2000), who used the Organizational Accident Model (OAM) developed by Lucian Leape to analyze critical incidents of errors in nursing. Nurses were asked to provide the information in a structured format, and supplemental information was obtained from a selected subgroup of the individuals through interviews. An exemplar of the findings was provided in the article.

Using the OAM for his case study, Meurier analyzed three types of information: (a) the 'active failures' or errors of nursing management such as delegation of a task to a less experienced nurse, poor supervision of this less experienced individual, unclear instructions, and poor communication; (b) the examination of local conditions which may have triggered the active failures such as inadequate staffing, a poor mix of experienced and inexperienced staff, and the physical design of the unit; and (c) the 'latent failures' or organizational factors that contributed to the working conditions identified as staffing of the unit, perceived lack of support of nursing work by nursing administration, and poor communication among all members of the healthcare team. Meurier's study revealed multiple levels of failure, which were often responsible for adverse events on a systemic level; however, the study did not explore why the errors were or were not reported.

***Nursing medication systems*.** One of the first systems to come under scrutiny in nursing became the frequently studied medication administration system. Baker (1997), Covell and Ritchie (2009), and Stratton et al. (2004) used multiple and mixed methods to study various aspects of error reporting related to medication administration errors. Baker

(1997) performed an ethnomethodological study in a single hospital to study the medication administration practices of nurses and identified three major groups of findings: (a) situated and embodied logics, which included such things as 'reading between the lines' of medication orders and using medication rounds to gather additional information on the patients, (b) criteria for redefinition of error, and (c) serendipitous findings including other institutional rules to which nurses resorted in order to provide structure to their activities. The concept of redefinition of errors was explored in depth, which consisted of 'if – then' statements. For example: 'if it's not my fault, then it is not an error' or 'if everyone knows, then it is not an error' or 'if you can put it right, then it is not an error.' The statement of 'not my fault' was widely applied because the institutional error reporting form required that someone 'be held responsible;' therefore, if there was no single individual who could shoulder blame, a report was not made. Although this study was limited to a single researcher at a single institution, findings gave early meaning to the decision factors that nurses used when determining if an event was an error. Once the determination was made that the event was an error, the research did not include questions about whether or not the nurse did or did not report the error.

Stratton et al. (2004) performed a descriptive study on a convenience sample of pediatric and adult hospital nurses regarding their perceptions of why medication errors occur and why medication errors are not reported. The researchers developed a three-part questionnaire that contained Likert scales whereupon the participants ranked their answers. Although the questionnaire was pilot tested prior to the principle study, no follow-up discussion existed regarding the instrument's reliability or validity. Likewise, no allowance was made for individual answers, only those on the scale. The highest

ranked barrier relating to organization management items was the 'nurse administration focuses on the person rather than looking at the system' (p. 389). The highest ranked barrier related to individual/personal items was that 'nurses fear adverse consequences from reporting' (p. 388). As stated previously, since nurses could not expand on their answers, a significant gap yet remained because respondents were not provided an opportunity to express their reasons for their answers.

Covell & Ritchie (2009) studied nurses' responses to medication errors in an effort to understand how nurses identify strategies involved in reporting medication errors. Fifty registered nurses participated in a mixed methods design in which data were collected concurrently using semi-structured interviews and questionnaires. Participants were asked to 'tell a story' about a medication error and then use that incident to answer five open-ended questions about how they responded to that error. Four subscales were used to measure nurses' perceptions of barriers to medication reporting, and the highest ranked barrier was fear of adverse consequences. In findings from the data of the qualitative analysis of the interviews, nurses relayed that the decisions to report an error were influenced by their knowledge and experience, by their relationships with their colleagues, physicians, and the unit manager. After these, decisions to report were influenced by the type of error and by the current workload. One nurse spoke of following the "culture of the floor … if we have good relationships, we prefer not to do incident reports" (p. 290). An additional component of the story contained a formal and an informal reporting process. If the event was addressed by any means, even solely by discussion with a colleague, the error was considered reported.

Although these findings of the single, small sample size study identified external factors that influenced a nurse's decision to report an error, that study did not pursue questioning that delved into the nurse's internal decision-making process. The participants in that study were allowed to consider informal reporting as adequate reporting and they were not held to the expectation of formal reporting. Perhaps the expectation of formal reporting might have affected their decision to report the error in a different way. Even though questions addressed former experiences following the reporting of the error, those questions failed to address "how" current or past experiences formed or influenced each participant's decision-making process within the healthcare system.

Experiences of error reporting within a healthcare system. Researchers have studied nurses' experiences with error reporting within a healthcare system using quantitative (Meurier, Vincent & Parmar, 1997; Lewis, Baernholdt, & Hamric, 2013), qualitative methods (Crigger & Meek, 2007; Spears, 2002; Scott et al., 2009) and mixed methods (Elder, Brungs, Nagy, Kudel, & Render, 2008). The language of studies varies; one study used the term "errors" (Elder et al., 2008; Lewis et al., 2013; Meurier et al., 1997; Spears, 2002) while studies used the terms "incidents" (Meurier, 2000), "events" (Scott et al., 2009), or "mistakes" (Crigger & Meek, 2007). Meanwhile, other studies attempted to determine systemic cause and consequence of error (Elder et al., 2008; Meurier et al., 1997), or seek the personal experiences of the nurses involved in error reporting (Crigger & Meek, 2007; Lewis et al., 2013; Spears, 2002; Scott et al., 2009).

Meurier, Vincent, & Parmar (1997) surveyed 175 nurses regarding the causes and consequences of errors as well as the potential for error to initiate changes in practice. The 22 item questionnaire was a modification of one used in a previous study of medical mistakes; however, the authors altered the title to read 'inappropriate nursing decisions and actions'. Meurier et al. defined the concept of an error as "a wrongful decision, omission or action for which the nurse felt responsible and that had adverse or potentially adverse consequences for the patient and that would have been judged wrong by knowledgeable peers at the time it occurred" (p. 113). Both the title of the study and definition of error convey the punitive nature and personal responsibility associated with errors and could thereby limit the freedom a participant felt to answer questions honestly.

Meurier et al. (1997) included in their results several types of errors including: errors of communication, errors of planning and intervention, errors related to inexperience and lack of knowledge and/or information, and emotional distress in response to errors. The authors concluded that "staff be encouraged to accept responsibility for their error" (p. 111).

Although Meurier et al. had a large sample size and used a previously validated tool, the changes they made to the tool were not validated, and the checklist of responses did not allow for further exploration of the issues behind the answers. The overall hostile tone of the study brings the accuracy of the findings into question. More information could have been gathered by using non-threatening language and allowing individualized responses to questions.

Cook et al. (2004) used multi-method research over three years to study the organizational processes used to recognize medical errors. Participants agreed that errors

were commonplace in healthcare settings; however, perceptions of errors were highly influenced by preconceived notions of what constitutes an error and what kind of events should be reported. Nurses expressed feelings of being unable to question physician judgment due to perceived lack of similar level of knowledge; therefore, they were uncomfortable reporting a medical error if a physician was involved.

Overall, Cook et al. found that participants agreed that errors were commonplace in the healthcare settings. Of all respondents, 78% believed that error reporting was primarily nursing's responsibility, and less than one-quarter of all respondents (22%) believed that the responsibility for patient safety should be shared equally among the healthcare team. Results of Cook et al. are difficult to interpret given the multiple modes and variety of responses to the tools used. Responses covered a wide variety of topics aside from reporting, and only the 'when' and 'how' issues of reporting were explored, not the 'why.' Since nurses were not the primary focus of Cook et al.'s study, little information is applicable to nursing practice.

Spears (2002) used phenomenology to study nurses' experiences with error reporting. Purposeful sampling led to one-on-one interviews with 12 registered nurses. Results identified six categories of themes (1) nurses are affected emotionally by the error, experiencing such things as anxiety, loss of trust, and embarrassment; (2) errors are multi-factorial; (3) nurses feel responsible for errors, including themes of self-blame, ownership, and accountability; (4) nurses learn and make changes as a result of an error; (5) nurses describe errors as inevitable; and (6) nurses have high expectations of their performance. Findings from this small sample study pertain to post-error reporting and

communication but did not include any discussion of specific issues that affected a nurse's initial decision to report or not to report the error.

Crigger and Meek (2007) used grounded theory to explore nurses' responses to making mistakes. Ten nurses were interviewed, and four categories of 'self-reconciliation' were identified. The reconciliation encompassed coming to terms with the reality of the mistake ('reality hitting'); determining or weighing the need to report the mistake ('weighing in'); deciding on the best trajectory for responding ('acting'); and finally, evaluating ('resolving') the event. In the 'reality hitting' phase, the initial shock of realizing an error had occurred was followed by remorse and second-guessing. Nurses mentally compared their actions with the social standards and personal ideals of the intended actions. In the 'weighing in' stage, the nurse determined the time and method of reporting, if indeed a report were made. As part of this process, participants determined whether the mistake was one they identified as a "real mistake" or a "non-mistake." A real mistake was one the participants thought should be reported because the primary indicator was that the mistake resulted or could have resulted in harm to the patient. The next stage, 'acting,' depended on whether the mistake was reported or not, which led to two distinct trajectories: one for an error that was publically reported and one that was not publically reported. Reporting, if done, was usually to an immediate supervisor or physician. The study's participants voiced an expectation of punitive responses to reports. In the final stage, 'resolving,' the nurses evaluated the harm that had or had not occurred because of their action and expressed feelings of uncertainty of their ability to provide adequate care to patients. The participants also described feelings of remorse and a heightened awareness of their practice for an extended time following the error event.

Crigger and Meek's (2007) study was limited in size to (n=10) nurses who were not expected to file a formal report as long as reporting to a supervisor had occurred. The authors admitted that they had not previously explored the trajectory of unreported errors; thus, their understanding of the process was limited. However, the authors discovered a new concept, "weighing in," which holds potential for further study to add to the knowledge base of how decisions to report errors are made.

Elder et al. (2008) explored the use of focus groups in the medical error decision making practices regarding (a) formal reporting, (b) telling someone else about a mistake, or (c) keeping silent. Their study's convenience sample (n=33) included nurses from four hospitals. Responses were compared and contrasted with results of a safety culture survey completed by a random sample of nurses (n=92) from those same units. The authors did not identify how the participants, if any, were divided into groups; therefore, the reader cannot know if cross participation existed between the written surveys and interviews.

Responses to the anonymous safety culture survey revealed 'socially desirable' answers, with the majority of nurses indicating that they usually or always reported errors and received feedback. Results of the focus group discussions were, however, distinctly different. In the focus groups, nurses gave time pressures and the presence or absence of patient harm as priorities to determine if formal report of the error was made. The nurses were also likely to take into consideration the hierarchal relationship between themselves and the other persons involved when reporting an error. Nurses were only likely to report an error to the physician if harm to the patient had occurred, and nurses described the use of a complex language designed to circumvent actually telling the physician outright that a mistake had been made. Participants were often cognizant of which physicians were

more receptive to hearing about errors and would wait until the 'right' physician was available to report the error.

Elder et al. (2008) determined from the focus groups that the nursing culture in the units under study still emphasized personal failure as a cause of error, especially when considering reporting an error made by others. Despite the results of the safety culture survey indicating nurses received feedback, reactions in the focus groups indicated this was not consistent with experience. Focus group members indicated that feedback was oblique and not directed at the actual event; rather, feedback was guised in terms of 'staff education' or in the form of new standards or guidelines.

Elder et al.'s study demonstrated how information can be gained through use of combined methodologies and discussed the influence of factors that affect error reporting decisions; however, the findings did not hone in specifically as to what factors in which circumstances played a role in the decision making process to report an error. Study criteria did not hold respondents accountable to make formal error reports; instead, the authors focused on verbal reports to parties involved in the error.

Scott et al. (2009) focused their research about experience with medical errors from the standpoint of healthcare providers being 'second victims' of the errors. The term "second victim" was coined by Wu (2000) as a description of the impact of medical errors on physicians. Scott et al. (2009) interviewed 31 healthcare professionals (10 physicians, 11 nurses, and 10 other healthcare professionals) regarding their involvement with a patient safety event and the aftereffects of the experience. Six stages of recovery were identified. The recovery encompassed identifying the moment the event was detected ('chaos and accident response'); feeling internal inadequacy and isolation

(‘intrusive reflection’); seeking support from a trusted individual (‘restoring personal integrity’); wondering about repercussions affecting job security (‘enduring the inquisition’); attempting to decide in whom they were ‘safe’ to confide (‘obtaining emotional first aid’) and finally, retaining memories of the event in their future practice (‘moving on’). In the ‘chaos and accident response’’ phase, the realization of an event was followed by both internal and external turmoil. In the ‘intrusive reflection’ stage, the participants described asking themselves multiple ‘what if’ questions as a means to understand the event. The next stage, ‘restoring personal integrity,’ focused on the individual’s feeling of self-doubt and lack of clinical confidence. While ‘enduring the inquisition’ the focus was on the individual’s concern about job security and personal liability in a litigation situation. The stage ‘obtaining emotional first aid’ focused on participants’ attempts to confide in someone about the error but having concerns about the privacy and legal considerations of relating the error event. In the final stage, ‘moving on,’ the participants described pressures both internal and external to put the event behind them. Three potential paths of ‘moving on’ were discovered: dropping out (leaving nursing), surviving (returning to previous performance levels), or thriving (making something good come from the event).

The Scott et al. (2009) study demonstrated a larger-than-average sample size (n=31) for qualitative interviewing studies; however, only one-third of the participants were nurses. The presence of other healthcare professionals in the data confounds the ability to apply the results to nursing in more general terms. The study made no mention regarding the types of units from which the participants were selected; therefore, no opportunity exists to examine the effects of an intensive care versus non-intensive care

environment in their findings. However, the author's application of the 'second victim' phenomena to the medical error experience is unique to research into medical errors and holds potential for further study to add to the knowledge base of the aftermath of errors.

Lewis et al. (2013) performed an integrative literature review of the effects of medical errors on nurses. The integrative literature review was structured according to standardized methodology and yielded 21 articles for analysis. Findings were examined to determine specific variables related to nurses' responses to medical errors in terms of the system, nurse characteristics, interventions, or nurse outcomes. Findings demonstrated that characteristics of the work unit such as the overall work environment and the nurse manager were important to nurses' experiences with medical errors. Increased anxiety following an error resulted from a punitive work environment, and nursing managers exerted either a positive or a negative impact on the experience depending on the level of support perceived by the nurse. The number of years in nursing affected a nurse's experience with errors. Novice nurses were concerned about their self-image after an error, and veteran nurses were more likely to make constructive changes after an error. Interventions such as disclosing the error to the patient and feeling supported after the error also affected nurses' experiences. Nurses believed that telling the patient about the error was part of "making the medical error right" (p. 156) and allowed nurses to feel closure. Support following the error, both formal and informal, was important to the nurse's restoration of personal integrity following an error. Lewis et al. identified four outcomes following nurses' experiences with errors in their literature review: burnout, moral distress, intention to leave, and constructive change. From their findings, they proposed a model of nurses' experiences with medical errors. The model

showed that interventions of disclosure and support to nurses after medical errors are moderated by system characteristics (work unit) and nurse characteristics (number of work years), both of which affect nurse outcomes (burnout, moral distress, intention to leave and constructive change). These interactions suggest a dynamic process is in operation; therefore, Lewis et al. suggested that more research is necessary to test the proposed reciprocal relationships.

The integrative literature review by Lewis et al., (2013) may have failed to capture all relevant studies using the standardized structured method. The review also highlighted the multitude of research methodologies and the wide variety of settings used to explore this newly developing area of research; therefore, further exploration of the topic by direct interviewing of nurses would be beneficial.

Barriers to error reporting within a healthcare system. Studies regarding barriers to reporting have been done using quantitative methodology through surveys (Evans et al., 2006; Uribe et al., 2002). Themes emerged from studies such as fear of consequences (Evans et al., 2006; Uribe et al., 2002; Hartnell, MacKinnon, Sketris, & Fleming, 2013) a focus on person (Stratton et al., 2004; Hartnell et al., 2013), hesitancy to report on others (Uribe et al., 2002), and reporting being too time consuming (Evans et al., 2006; Hartnell et al., 2013).

Uribe et al. (2002) designed a survey to collect information regarding perceived barriers to reporting and the potential for the barriers to be modified. This self-designed survey developed by an expert panel contained categories of potential barriers to reporting, and participants were asked to rank the likelihood of the item as a barrier on a 1 to 5 Likert scale. In a second section, the participants were asked to rank again on a 1 to

5 scale their perception of how modifiable the barriers were. The tool was distributed to a quota sample of physicians and nurses in a single Midwestern hospital, and 17% of the surveys were returned. Of the barriers to reporting, six were noted to be statistically significant to both groups: (a) time involved in documenting an error; (b) extra work involved in reporting; (c) hesitancy regarding 'telling' on someone else; (d) reporting is unnecessary because the error had no negative outcome; (e) not being able to report anonymously; and (f) fear of lawsuits. The same items ranked low on the ability to modify scale of the second section of the survey. Items regarding structure and process were perceived as more modifiable.

In addition to the lack of validity and reliability of a self-designed survey, the poor return rate limits the ability to draw conclusions from the study. The results are difficult to generalize given that other institutions will likely have different processes in place that would negate the structure and process findings. Additionally, physicians who were included in Uribe et al.'s (2002) sampling confounded the results; therefore, application or extrapolation to nursing's concerns would be difficult. Finally, by limiting answers again to a scale, the opportunity to learn from individual responses was lost.

Evans et al. (2006) used anonymous surveys to collect data from a cross-section of doctors and nurses to identify factors inhibiting the reporting of incidents, from which they achieved a 71% response rate. The survey contained 19 potential reasons for not reporting an incident and asked participants to rate on a five-point Likert scale the extent to which they agreed each item was a barrier. The top five barriers most often selected by nurses were: (a) I never get any feedback on what action is taken; (b) When the error is a near miss, I don't see any point in reporting it; (c) When the ward is busy I forget to make

a report; (d) the incident report takes too long to fill out, and I just don't have the time; and (e) the incident was too trivial. Similar to Uribe et al.'s (2002) study, Evans et al.'s (2006) study mixes physician and nursing responses and confines answers to a pre-set scale that does not allow for participant input. Each study stopped short by only identifying and listing the barriers; they did not explore the influence the barriers may have with determining whether or not the nurse would report the error.

Fictional scenarios of error reporting within a healthcare system. Researchers have used healthcare-systems based fictional case scenarios as a means to elicit nurses' attitudes about error reporting (Espin, Levinson et al, 2006; Espin, Regehr et al., 2007; Lawton & Parker, 2002; Meurier et al., 1997). Studies of nurses' attitudes about error reporting were performed by both quantitative (Lawton & Parker, 2002; Meurier, Vincent & Palmer, 1998) and qualitative methods (Espin, Levinson et al., 2006; Espin, Regehr et al., 2007). One common theme that emerged was the presence or absence of harm done to a patient because of the error (Espin Levinson et al., 2006; Espin, Regehr et al., 2007; Lawton & Parker, 2002; Meurier, Vincent, & Parmar, 1998). A second common theme was the delineation between professional roles and responsibilities (Espin Levinson et al., 2006; Espin, Regehr et al., 2007). A third common theme was the application of practice standards or protocols (Espin Levinson et al., 2006; Espin, Regehr et al., 2007; Lawton & Parker, 2002).

Lawton and Parker (2002) used fictional patient care scenarios and outcomes to study healthcare professionals' likelihood of reporting events as errors. The scenarios dealt with issues of whether a protocol was or was not followed, or no protocol was available to guide behavior. The outcomes of the scenarios varied between poor, good, or

bad in different versions. Analysis revealed that participants were significantly more likely to report the practice of another if the scenario described a bad outcome, and a violation of protocol was more likely to be reported than an improvisation (where no protocol existed). Where there was no protocol available, healthcare professionals were least likely to report the actions of others, even if the outcome was bad.

Espin, Levinson et al. (2006) used grounded theory methodology to study the perceptions of error between a surgical team and surgical patients' (lay persons). Nine surgeons, nine nurses, ten anesthesiologists, and eleven patients (recruited by their participating surgeons) were interviewed regarding their perceptions of acts of error in an operating room (OR) based on four scenarios used as prompts by the authors. Results indicated that OR team members and patients agreed on what constituted an error, especially when deviations from standards and negative outcomes were features of the scenarios. Patients and healthcare professionals also agreed on the principle of 'no harm no foul' regarding the reporting of the event. Only nurses were asked about reporting in this study. The rationale given by the researchers was because, in the institutions in which this study was conducted, reporting is perceived as only a nursing responsibility.

Nurses and patients differed significantly in which errors they felt should be reported. Nurses were only willing to report acts they considered to be within their scope of practice, even though they identified errors within case scenarios. Reporting outside their discipline was determined as inappropriate or unnecessary. Nurses believed such incidents would be documented in the other professionals' documentation. Patients approved of reporting all error events and advocated disclosure of all aspects of errors to the patient.

As a follow up study and using fictional incidents, Espin et al. (2007) more fully explored the influence of scope of practice and patient outcomes on error reporting. Incidents were divided into scenarios with either negative or non-negative outcomes and involved either nurses or other OR team members. In the final analysis, participants first indicated that if the surgeon or another surgical team member had performed an error, the responsibility lay with that individual to report it; the nurses were not expected to report the incident. Second, the participants allowed for an 'informal' reporting system that referred to nurses talking to each other about the events or recording the event in the nurses' notes as an alternative means of communication. Finally, the nurses' relationship with and confidence in team colleagues also had a significant influence on the informal reporting procedure; reporting was more likely to occur amongst team members who were comfortable with each other. The outcome of the event (i.e. whether patient harm occurred or not) had an ambiguous influence on the rates of reporting; that is, more important was the relationship between the team members.

Meurier et al., (1998) studied registered nurses responses to a description of an error in which there was either a serious or a non-serious outcome. The study used questionnaires with a 9-point Likert scale to gauge responses, and items were coded as internal (nurses blame themselves) or external (nurses blamed the environment) attributes. Findings demonstrated nurses were most likely to blame themselves, especially more so in the scenario with a serious outcome. Findings noted that when nurses internalize the error, nurses might overlook or discount the external factors of the system in which they work as contributing factors.

A critique common to all three of these studies was the use of fictional scenarios. The use of fictional scenarios in studies regarding error reporting can only speculate about which actions nurses may or may not take. Psychologists and behaviorists study what is termed the "attitude-behavior gap," defined as the phenomena in which a person says one thing but acts differently from how s/he stated s/he would act in a given scenario, especially when there were confounding factors involved (Ajzen, & Fishbein, 1977). Hovland (1959) explored the difference in results yielded from experimental or controlled exposure studies versus results yielded from sample survey studies that are performed in natural environments. Hovland believed that differences in results between the two come from many sources. During an experimental study, the participants were exposed to a full range of possibilities within a scenario, factors, or scenarios that were expected based on a theory of the situation. In a sample survey study, the participants' exposure was only limited to what they had experienced because more significance was attached to a personal experience, especially those experiences that involved socially significant attitudes. Although one experimental group in the study shared lucid details from immediate experiences, based on a time perspective, researchers have neither control over when participants' experiences occurred nor how remote those experiences are from individuals comprising a specific survey group.

An experimental study seeks to show both sides of an issue to a participant, whereas in a sample survey study, the issue is more personal and centered around the person's interpretation of the experience. Finally, an experimental study takes samples from populations most easily reached. Sample survey studies exercise random sampling within a population that represents the phenomena of interest. These are the reasons given

by Hovland that experimental studies are most likely to demonstrate changes of attitudes than a sample survey study; however, the changes in attitude demonstrated by experimental studies have the same limitations as the research itself in that they are based in theory and unnatural settings. Studies that include sample survey types are most appropriate to the people who are experiencing the phenomena in order to achieve an understanding of the phenomena that occurs in the natural setting. This method of study invokes the influence of the culture of the environment (Quellette & Wood, 1998).

Culture in Health Care

A culture represents the values, beliefs, and behaviors shared by members of groups, including values regarding error, blame, and punishment. Culture influences how information is shared, how administrators relate to subordinates, and how the group adheres to rules (Helmreich & Davies, 2004). Culture is described as the bonding agent of an organization and symbolizes the philosophy of the leaders, which in turn affects the behaviors of employees (Roberts, 1993; Spath, 2000). Definitions of culture frequently include concepts of values, attitudes, normal practices, policies, and behaviors of personnel. Culture is fundamentally described as "the way we do things around here" (Pronovost & Sexton, 2005, p. 231), whereby the word "here" refers not to the organization as a whole, but rather, the particular unit in which individuals work (Pronovost & Sexton, 2005). Each unit has individual expectations regarding how varying situations are handled. The normal, everyday 'work arounds' that occur on a systemic level demonstrate an unspoken agreement among members of the unit to continue on with the status quo rather than to seek change within the system (Espin, Lingard, 2006).

Safety culture. Nieva and Sorra (2003) described a safety culture as "a performance shaping factor that guides the many discretionary behaviors of healthcare" (p. ii17). An exact definition of safety culture does not exist; however, literature regarding safety cultures has similar themes, namely that organizations with an effective safety culture consider safety a top-level priority. More specifically, components of a safety culture include: 1) acknowledgment of the high risk, error-prone nature of an organization' activities, 2) blame-free environment where individuals are able to report errors or close calls without punishment, 3) expectation of collaboration across ranks to seek solutions to vulnerabilities, and 4) willingness on the part of the organization to direct resources to address safety concerns (Cooper, 2000; Geller, 2000; Helmreich, Foushess, Benson & Russini, 1986; Helmreich & Merritt, 1998; Roberts, 1988; Roberts, 1993). Subsequent research regarding improvement of an organization's safety culture alludes to the idea that a safety culture has always existed as part of an organization (Pronovost & Sexton, 2005; Pronovost et al., 2003); consequently, the focus then shifts to what are the means to measure the level of a safety culture.

In 2004 the AHRQ (2004) designed, piloted, validated, and released the Hospital Survey on Patient Safety Culture (HSPSC), a quantitative tool developed to determine a healthcare organization's level of safety culture. The purpose of this survey was to assess learning needs of the current safety culture including strengths and weaknesses, to compare with other institutions and to trend changes in scores over time. The report provided measurable results that hospitals can use as a basis for self- comparison in their efforts to improve a culture of patient safety in their institutions (AHRQ, 2004).

Safety culture and error reporting. The HSPSC measures four primary outcomes: 1) frequency of event reporting, 2) overall perceptions of safety, 3) patient safety grade, and 4) number of events reported (AHRQ, 2004). The frequency of events reporting section asks: When a mistake is made, how often is it reported when it either: 1) is caught and corrected before affecting the patient, 2) has no potential to harm the patient, or 3) could harm the patient but does not. Regarding the query on the number of events reported, respondents are asked to select a range of the number of reports made in the last 12 months (zero reports, 1-2 reports, 3-5 reports, 6-10 reports, 11-20 reports and more than 21 reports) (AHRQ, 2004). Repeated measurements of these factors would allow an organization to track changes in employees' perceptions and actions as patient safety initiatives are gradually implemented into practice throughout the institution.

Maintaining patient safety and actual reporting of errors are linked to culture in conceptual terms by employees' values, attitudes, and norms of practice, policies, and behaviors. Cultural factors are often cited as reasons for not reporting errors, such as: fearing blame or seeming incompetent to colleagues, or fearing reprimands from physicians and/or nursing management (Cook, 2004; Espin, Lingard, 2006; Jeffe, 2004; Stratton 2004; Taylor, 2004; Uribe, 2002). There may be cultural disagreement about what constitutes an error, thereby making unclear what should or should not be reported (Cook, 2004; Espin, Lingard, 2006; Stratton, 2004; Taylor 2004). Some cultures actively avoid conflict in order to preserve relationships with colleagues (Lyndon, 2008). As previously discussed, the effectiveness of a reporting system depends on the opinion and standards of those persons who utilize them (Waring, 2005). One of the keys to success, when developing a reporting culture, is to eliminate personnel's fear of retribution

(Ashcroft et al., 2006). On another vein, Nieva and Sorra (2003) argued that reporting systems alone will not overcome a punitive culture where error reporting is unsupported.

Safety culture and teamwork. The HSPSC also measures several dimensions of the safety culture at a unit level and at a hospital-wide level. Of the ten dimensions surveyed, six involve the concept of teamwork in some manner: 1) organizational learning-continuous improvement, 2) teamwork within and 3) across hospital units; 4) communication openness, 5) feedback and communication about error, and 6) non-punitive responses to error (AHRQ, 2004). Each dimension contains an element of working together with and alongside others within the health care system.

The study of teamwork and interprofessionalization in medicine is a relatively new discipline that requires intraprofessional cooperation (McCray, 2003). This current area of study focuses on how this new discipline is informed by and is adapting existing tools from the aviation industry (Fletcher et al., 2003; Guerlain et al., 2005; Helmreich, 2000). Teamwork and communication deficiencies have been demonstrated in trauma care (Michaelson & Levi 1997; Santora, Trooskin, Blank, Clarke & Schinco, 1996), in intensive care (Howard, Gaba, Fish, Yang & Sarnquist, 1992), and in the OR (Christian et al., 2006; Lingard, Reznick, Espin, Regehr, & DeVito, 2002; Sexton, Thomas, & Helmreich, 2000). Efforts were made to recognize the role of skills such as coordination, communication, situational awareness, vigilance, and conflict resolution in preventing adverse events (Helmreich, 2000). Studies revealed that better teamwork was associated with fewer errors (Catchpole, Mishra, Handa & McColloch, 2008; Mishra, Catchpole, Dale & McColloch, 2008).

A model of teamwork being transferred to medicine is that of Crew Resource Management (CRM) (Bianchi-Sand, 2003). Introduced by the airline industry, the basis of CRM is to teach crews how to draw upon the different capabilities and knowledge of a given group of people. Captains are taught how to utilize the skills and resources available to them through their crews, while crewmembers are taught assertiveness in bringing concerns to the captain, as well as situational awareness, adaptability, and decision-making. Skillful use of CRM is thought to lead to improvements in safety, teamwork, and communication by increased interdisciplinary collaboration (Lyndon, 2008). A drawback to use of the CRM in health care is that, while its use in aviation was based on challenges from a pilot's perspective, few studies have explored the issues healthcare workers face in maintaining a safe environment. The basic challenge is a lack of agreement on the meaning of teamwork and collaboration (Thomas, Sherwood, Mulhollem, Sexton, &Helmreich, 2004).

Team attitudes about reporting. Taylor et al. (2004) studied errors reported by physicians and nurses with the goal of determining healthcare teams' attitudes about error reporting. A survey, developed by an in-house patient safety organization (PSO), was sent to a random sample of physicians and nurses who practiced in a single hospital and achieved a 70% response rate. The survey items were in the form of both Likert scales and multiple-choice questions. The authors did not allow for open-ended responses, which limited the information gathered from their survey. Initial results indicated that nurses reported higher proportions of their own perceived medical errors and errors made by others (e.g. ancillary staff) but not by physicians. Additionally, nurses reported more than 80% of their own errors, compared with physicians who reported their own errors

<20% of the time. Multiple reasons were given by respondents for not making reports: (a) unsure about what was considered a medical error; (b) concerned about implicating others; (c) unsure who had the responsibility to report errors; (d) not important to report an error that did not reach the patient; (e) concerned about being blamed or judged incompetent; (f) incident form was too complicated; (g) not important to report an error that did not harm the patient; and (h) reporting an error did not make any difference.

Taylor et al. (2004) developed their own survey; however, the survey was never tested for validity and reliability. Methodologically, their data was mathematically calculated through statistics and chart plotting; cultural concerns were not addressed. Therefore, Taylor et al.'s quantitative study-design left a huge gap in understanding cultural barriers. An opportunity exists for a different study design that might capture key decisions about why survey questions were answered the way they were because more information is needed about the cultural influences affecting error reporting.

Jeffe et al. (2004) conducted nine focus groups chosen from a convenience sample of volunteers in 20 academic and community hospitals to gain a better understanding of nurses' and physicians' perspectives regarding medical error reporting. Data from all focus groups demonstrated a lack of understanding about what should be regarded as a reportable event. There was general agreement that events, which were serious or harmful to a patient, should be reported; however, beyond that, the consensus was less clear. The severity of the event and its likelihood of recurrence were the deciding factors for nurses. If the error was severe enough, they believed they should report the error because they would be 'found out' anyway. Participants acknowledged the impossibility of knowing the true outcomes because actual rates cannot be known if

they are not reported. All focus groups cited fear of repercussions and a perceived lack of confidentiality as a barrier. Jeffe et al. (2004) also noted that nurses who witnessed a colleague making an error also believed that speaking to that colleague directly was sufficient. Thus, they did not think they needed to complete a formal report because the action they took was adequate, and their action was a means to prevent the person who made the error from troublesome consequences. All groups agreed that complicated processes and shortage of staff were barriers to finding the time to make reports. Finally, lack of feedback was identified as a major barrier to reporting. Both physicians and nurses felt their efforts were 'wasted' by completing reports when neither follow-up nor their involvement was included later.

Overall, Jeffe et al.'s study is a good example of the type of information discovered when researchers ask participants to inform them on the subject. A criticism of this research is that the discussions were held as groups, and a group setting may not allow participants to feel comfortable to express true experiences or beliefs that they fear will not be socially acceptable; thus, in this study design, data might have been lost that could have otherwise been recovered by a confidential one-on-one session.

Team influences in error reporting. Ahern and McDonald (2002) used a descriptive survey to study the difference in beliefs of nurses who reported misconduct versus those who did not report it, termed by the authors 'whistleblowers' and 'nonwhistleblowers' respectively. The survey contained statements from sources including the ANA Legal Handbook, the Canadian Nurses' Association Code of Ethics, and other published research performed by the authors. Participants were asked to rank on a 1 to 5 Likert scale their agreement or disagreement with statements regarding

traditional views on nursing and statements of beliefs related to a whistle blowing experience. Although questionnaires were sent out to 500 nurses, only a 20% response rate occurred. Analysis identified four general belief clusters: (a) nurses' recognition that 'blowing the whistle' could be professionally risky but that the patients' needs took precedence over personal consideration; (b) nurses recognition of actions mandated by current ethical codes of practice; (c) nurses believed they lacked autonomy and were obliged to follow orders; and (d) nursing's belief in and conformity to authority.

Ahern and McDonald's (2002) study used a ranking system without individual input to determine the influence of codes of conduct and nursing ethics regarding error reporting. However, their study inquired neither about participants' personal experiences nor how participants' decision-making processes occurred. Their study's low response rate also makes validation of findings and application to other nursing experiences difficult to extrapolate to a larger population.

Attree (2007) used grounded theory to explore factors that influenced nurses' decisions to raise concerns about standards of practice. Situated in England, the study included semi-structured interviews with 132 nurses across a variety of disciplines. Analysis yielded one core category, 'professional dissonance,' which was comprised of three subcategories: (a) professional discrepancies, (b) professional discontent and disquiet, and (c) professional dilemmas and decisions. All of these were identified as conflicts that arose between nurses' duty to raise concerns and their fear that negative consequences would result. Raising concerns was seen as a "high-risk: low-benefit" (p. 395) act. Facilitating factors were described as an ideal culture that was open, where raising concerns was perceived as a professional duty and responsibility, and where

reported concerns were perceived as positive and constructive. None of the nurses interviewed believed that they worked in that type of environment.

Attree's (2007) study has a larger sample size than other previously discussed qualitative studies. The data represented a wide range of nursing experiences, which identified similar problems reported in other studies. The data supports the assertion that nurses believe they continue to work in a punitive environment. A more specific discussion about how that environment influences decisions about error reporting was missing.

Conclusion

Although improvements in surgical care were some of the first advances made in response to medical errors (Loeb & O'Leary, 2004), the 1999 IOM report finally addressed the need for systemic-level changes to healthcare (Kohn et al., 2000). Following the IOM report, JCAHO began to emphasize improvement in an institution's safety culture, part of which included a focus on medical error reporting (Poniatowski, 2004). The first national law offering federal protection to data obtained from error reports was implemented in 2005 (AHRQ, 2008). With that protection, healthcare leaders set out to accumulate data about medical errors within their own organizations; however, the leaders discovered that collecting this data was difficult because of the historic influence of punishment and shame that accompanied the reporting of medical errors (Loeb & O'Leary, 2004). A shift from an individual to a systemic focus became necessary (Ottewill, 2003).

Reducing errors through system theory has been accomplished in professions other than healthcare (Loeb & O'Leary, 2004); hence, aviation system theory began

informing nursing literature. In a continuing effort to minimize errors, Meurier (2000) studied the use of the OAM to analyze critical errors in nursing and discovered information on systemic factors of errors; however, he did not explore the influence of the system on reporting practices. For further error reduction, medication administration systems were studied (Baker, 1997; Covell & Ritchie, 2009; Stratton et al., 2004) in regards to nurses who were expected to administer medications. Baker (1997) failed to ask questions about reporting errors once the determination of an error was made. Stratton (2004) used a ranking survey to identify barriers to medication error reporting which forced nurses to check items from a list of responses and did not allow nurses to expand on their answers. Covell and Ritchie (2009) allowed nurses to consider informal methods of reporting and did not hold them to the standard of formal reporting, which did not allow for the collection of information into a systemic database. Covell and Ritchie (2009) focused on the experiences following the errors, but they failed to explore the timeframe between the time the error was made and then reported. No discussion of how the decision to report the error was made or if previous experiences with error reporting held influence over the decision.

Meurier et al. (1997) surveyed nurses regarding causes and consequences of error reporting but did so with an unvalidated, modified tool that contained hostile verbiage. Cook et al. (2004) used multiple methodologies and surveyed multiple healthcare professions; however, no clear conclusions regarding nursing perspectives were provided. Spears (2002) focused on post-error communication in her phenomenological study of reporting but she did not include discussion of issues that pertain to nurses' initial decisions to report or not to report the error. Crigger and Meek (2007) interviewed nurses

regarding error reporting and formulated a model of decision making from their findings. Of the categories defined by the study, the second stage of determining or weighing the need to report the mistake ('weighing in') was not fully explored as a new concept unique to the literature. Additionally, Crigger and Meek (2007) did not explore the aspect of non-reported errors in their study. The application of the 'second victim' phenomena to errors by Scott et al., (2009) demonstrated a potentially new avenue of research. Unfortunately, their research was too broad for purposeful use in this present study because they interviewed a cross section of healthcare professionals rather than limiting their study just to nurses; hence, a general application to nursing cannot be made. Lewis et al., (2013) obtained their data from a methodical literature review without any real-to-life application of their findings.

Meanwhile, Elder et al. (2008) claimed to have studied medical error decision-making practices; however, the reported data covered only culture, communication, and barriers to reporting. Focus on the individual's internal decision-making process was not achieved. Uribe et al. (2002) and Evans et al. (2006) focused their quantitative studies on barriers to reporting errors in a questionnaire using only Likert scales, which severely limited potential qualitative data to explain reasons for respondents' responses. In other studies, the use of fictional scenarios in error reporting only offered speculation as to what actions nurses might have taken because of the "attitude-behavior gap." Because of that gap, findings from studies based in fictional scenarios cannot be validated by real-life actions and do not offer assurances that the findings will remain consistent (Ajzen & Fishbein, 1977). Sample survey studies (Hovland, 1959) offer the best means of discovering real-life influences and actions since these studies are performed in natural

environments with people who are directly affected by the phenomena of interest; these studies rely upon real-world events instead of theory. Although sample survey studies may provide quantifiable data, qualitative interviews provide a key methodological element that can focus on a participant's personal interpretation of an event, which under grounded theory, might provide direct evidence for explaining and identifying behavior, the cultural environment, and relationships between the two.

Personal interpretation of an error is influenced by the culture in which that person works (Pronovost & Sexton, 2005). Culture is fundamentally 'the way we do things,' and research demonstrates that current culture regarding error reporting remains one of blame and concern about personal repercussions (Cook, 2004; Espin, Lingard, 2006; Jeffe, 2004; Stratton 2004; Taylor, 2004; Uribe, 2002); therefore, error reporting is not considered 'the way we do things.' By using impartial, nonjudgmental measuring tools such as the HSPSC, individual focus is removed and evaluations are made on a system-wide scale (AHRQ, 2004). Compiling system wide information on overall perceptions of safety and number of events reported allow individuals an understanding of what colleagues are doing without pointing individual fingers. The realization that reporting errors occurs within their culture may allow personnel to overcome fear of retribution and increase their personal frequency of error reporting (Ashcroft, 2006).

The aspect of teamwork within a system is important when considering error reporting practices and is, therefore, a significant portion of the HSPSC (AHRQ, 2004). The study of teamwork in medicine is a relatively new discipline (Helmreich, 2000), but already the literature demonstrates that improved teamwork is associated with fewer errors (Catchpole et al., 2008; Mishra et al., 2008).

Taylor et al. (2004) and Jeffe et al. (2004) studied team attitudes regarding error reporting. Taylor et al. (2004) used an in-house, invalidated survey of Likert scales and multiple-choice responses, which again omitted the opportunity for individualized answers and contained no exploration of error reporting decision-making processes. Jeffe et al. (2004) studied focus groups and gathered information of a more individualized nature; however, responses by participants were limited to perceived socially acceptable responses within the group setting. One-on-one sessions did not exist for further, private exploration and focus on the decision-making processes failed to occur; data reflected only the barriers to, and outcomes from, filing an error report. Although Ahern and McDonald (2002) and Attree (2007) sought to explore the differences between nurses who chose to report and those who did not report, their analyses focused on feelings of professional responsibility and moral obligations toward reporting. Neither study included information from nurses about why error reports were not made; rather, they focused on nurses who had made reports, which could be seen as reinforcing the feelings of being 'singled out' that discourages reporting (Attree, 2007). The act of simply having a reporting system in place that is used sporadically by personnel will not overcome problems within a punitive culture where error reporting is not supported (Nieva & Sorra, 2003).

Studying nurses' decision-making processes to report or not to report an error, could lead to improved identification of the systems' components in the culture that directly influence the rate of error reporting. Once future studies identify these cultural components, then appropriate interventions and educational seminars can begin to affect change within the culture so that error reporting no longer carries its current stigma.

Changing the current culture to one of open reporting could then permanently change 'the way we do it around here' to increased reporting rates. By increasing accuracy of and frequency of error reports, organizations are better able to intervene and improve or redesign systems to provide safer care to patients (Kohn et al., 2000).

Since errors continue to occur in healthcare settings, the contributing aspects of error reporting remain nebulous. Based on findings from previous research, this study was conducted to expand upon known data by using qualitative methods to explore licensed nurses' decision-making processes regarding error reporting. This study attempted to ascertain when nurses believed they had made, witnessed, or had knowledge of an error. To summarize, based on findings from previous research, this study expands upon known data by adding the following to the body of nursing knowledge:

1. Allow nurses to describe, in their own words in a private session, their decision making process regarding error reporting when they believe they have made, witnessed, or have knowledge of an error.
2. Continue to build on prior work by exploring in depth what the nurses' perspectives, attitudes, and influences were as related to determining an error and how to proceed following it.
3. Provide a model that could guide future interventions, change and improve nurses' decisions to report errors, and lead to increased error reporting rates, which could lead to a more complete evaluation of the current state of safe patient care.

4. Use a grounded theory methodology to achieve data saturation for the purposes of developing a model of thought processes that could be extrapolated to a larger population.

Chapter Three. Methodology

The research question driving this study was: What are licensed nurses' decision-making processes regarding reporting when they believe they have made, witnessed, or have knowledge of an error? The research question was explored using grounded theory as the underlying research methodology. This current chapter outlines the methods employed to test the research question and is organized into four sections. Each section includes a discussion of grounded theory and the specific means by which each of the following elements were applied: (1) grounded theory methodology, (2) sampling, (3) data collection, and (4) data analysis.

Grounded Theory Methodology

Grounded theory (GT) is intended to develop an integrated set of concepts that provide a theoretical explanation of the social phenomena under study (Corbin & Strauss, 1990). GT's purpose is to acquire a fresh understanding about patterned relationships between social beings and how these relationships and interactions actively construct reality for the persons involved (Glaser & Strauss, 1967). Research using grounded theory focuses on how subjective experiences of individuals can be abstracted into theoretical statements about causal relations between social contexts (Suddaby, 2006). Thus, grounded theory seeks to uncover relevant conditions as well as to determine how individuals respond to changing social conditions and to the consequences of their actions (Corbin & Strauss, 1990).

As previously noted in the review of literature, nurses have a strong sense of being judged by co-workers when reporting an error. These perceived judgments are part of the reality of nursing as a social experience. Using grounded theory methodology, the

goal of this research was to take the subjective experiences of the nurses in this study and construct from their statements theoretical relationships between the conditions that either prompted or discouraged the reporting of errors.

Sampling. As outlined by Charmaz (2006), grounded theory sampling is aimed toward theory construction, not for population representativeness. Initial sampling is used in GT to establish criteria for people, cases, situations, and/or settings of interest upon which a research field is focused. These criteria then identify relevant materials for the study. "Initial sampling in grounded theory is where you start whereas theoretical sampling directs you where to go" (Charmaz, 2006, p. 100). Theoretical sampling is discussed later under the heading, Data Analysis.

Research-specific, initial sampling. The initial sampling goal for this qualitative research project was 30 nurses. Charmaz (2006) suggested that for any study using GT, sufficient participants should be recruited to allow researchers a reasonable opportunity to explain and grasp the participants' empirical world, while at the same time augmenting the study with sufficient variations of the real world. Therefore, the focus of this research project was to recruit male and female licensed nurses to participate in this study as defined in Chapter I. Only this specified professional group was selected in order to avoid any cross-discipline influences and to eliminate how other medical specialties might view error reporting, as noted in the literature (Clayman, Clayman, Steele, & Seagle, 2007; Cohen et al., 2004; Kalisch & Aebersold, 2006; Rowin et al., 2008). Additionally, Page (2004) argued that nurses who work primarily in administration have differing views of errors and error reporting than do nurses who provide direct patient care; therefore, sampling was strictly limited to those who provide direct patient care.

Sampling in an intensive care unit. Sampling was further limited to those licensed nurses, female or male, who work in an adult intensive care unit (ICU) as direct patient caregivers. Evidence in the literature reveals that multiple errors occur in ICUs (Landrigan et al., 2004) and that critically ill patients may experience higher rates of adverse events and errors than other patient populations (Balas, Scott & Rogers, 2006). The complex disease processes and care procedures necessary to care for patients in an ICU make the patient care system vulnerable and prone to error (Donchin et al., 1995).

If a patient spends any part of his/her hospital stay in an ICU, chances of the patient experiencing an adverse event or error is high (Andrews et al., 1997). Bates et al. (1995) stratified their results by unit type and level of care, where the highest rates of adverse events occurred in medical ICUs (19.4 per 1000 patient days) when compared with medical or surgical care units (10.6 and 8.9 per 1000 patient days, respectively).

Patients in ICUs are considered at particularly high risk of adverse events and errors related to the nature of critical illness. Illness reduces a patient's resistance and ability to rebound from the consequences of error (Cullen et al., 1997). Adverse events or errors can require additional monitoring and/or testing, additional medical or surgical therapy, or life-sustaining treatment (Giraud et al., 1993), and, according to Bates et al. (1995), adverse events are associated with significant increases in morbidity and mortality.

There are a number of reasons adverse events and errors occur more frequently in ICUs than in other areas. The ICU is a fast-paced, complex environment (Beckmann et al., 2003; Cullen et al., 1997) characterized by complex interactions between multiple medical teams (Cullen et al., 1997; Dodek & Raboud, 2003; Rothschild et al., 2005).

Nurses must be observant of changes in patient condition, be knowledgeable about multiple types of equipment, and be able to communicate effectively with patients, families, and other healthcare providers (Balas et al., 2006). Patients often have multi-systemic illnesses that are more complex to manage (Boyle, O'Connell, Platt & Albert, 2006) and their potentially rapidly-changing conditions require urgent, high-level decision making by nurses and physicians with various levels of training and often incomplete data (Beckmann et al., 2003; Boyle et al., 2006; Kane-Gill & Weber, 2006). The care provided in ICUs continues to grow in complexity due to the introduction of new technologies and medications (Kane-Gill & Weber, 2006). On average, patients in the ICU are prescribed twice as many medications as non-ICU patients. More than half the drugs used in the ICU fall into a therapeutic category that are either error-prone or have the potential to result in serious clinical outcomes if errors occur during their administration (Kane-Gill & Weber, 2006).

Although intensive care nurses provide the majority of error reports, few studies have evaluated factors that affect an ICU nurse's willingness to report errors (Osmon et al., 2004; Ricci et al., 2004). Balas et al. (2006) was one of the first to examine extensive error reporting by critical care nurses; although their study asked nurses about their experience with committing errors, Balas et al. (2006) asked neither if the errors were reported nor the reasons for reporting or lack of reporting the errors. Because of the high-risk nature of an ICU and the increased likelihood of errors occurring in the ICU, versus other, less-intensive care units, ICU nurses have a greater chance of making, witnessing, or having knowledge of an error.

Study Sites

The city of Indianapolis has six hospitals with adult ICUs that are potential study sites. The clinical sites were recruited one at a time, and a maximal number of nurses were interviewed from each site. The target was thirty interviews; therefore, the average requirement was a minimum of five interviews per site.

Category Saturation

More interviews may be necessary to achieve category saturation, which is the point where no new evidence appears in the data collection process and is one of the methods of verification in grounded theory (Strauss & Corbin, 1998). Saturation is based on an assessment of the quality and rigor of an emerging model and is a "combination of the empirical limits of the data, the integration and density of the theory, and the analyst's theoretical sensitivity" (Glaser & Strauss, 1967, p. 62). Signs of saturation include repetition of information and confirmation of existing conceptual categories (Suddaby, 2006). An arbitrary number of interviews cannot determine category saturation (Suddaby, 2006); however, for the study's initial IRB approval, the number thirty was purposely selected with the understanding that should category saturation not be achieved with that number, additional interviews would become necessary to achieve the goal.

Engaging participants. Reflexivity is the influence of investigator-participant interactions in the research process. Relationality refers to the power and trust relationships between participants and researchers. These concepts of reflexivity and relationality have the potential to increase the validity of the findings in grounded theory studies (Hall & Callery, 2001). Data are produced through the meaning created during the interaction between researcher and participant; therefore, the quality of the data would be

influenced by the nature of the relationship between researcher and participant (Hall & Callery, 2001). Reflexivity conveys how the researcher conducts the research, relates to the research participants, and represents them in written reports (Charmaz, 2006). Reflexivity can also assist with validity because reflexivity is concerned with the interview and participant observations, processes, and identifying assumptions that are taken for granted by participants and researchers. These assumptions can influence data collection (Hall & Callery, 2001). Relationality recognizes connectedness between the researcher and the participant and is rooted in caring and equity (Lincoln, 1995). Relationality provides an opportunity for reciprocal relationships, such as the effects of the investigator's knowledge and expectations from participants about the research process (Hall & Callery, 2001).

Research-specific engagement of the nurses. Prior to beginning the study and as part of support for the IRB proposal, the Chief Nursing Officers (CNOs) of each site were contacted in order to explain the purpose of the study and to seek their support. Time was spent with the staff in order to increase familiarity with the care environment and the nursing professionals who worked in each unit. Two days were spent on the unit during an agreed upon period, wherein the role of nurse researcher was to observe the work patterns and activities of the nurses and the unit. No data was collected during that period. The study was discussed with the licensed nurses while spending time with them in order to build a relationship and to establish a rapport. Rynes, McNatt and Bretz (1999) discovered that increased time spent with the potential subjects of a research project increases the affective trust of the participants toward the person conducting the research. Several other studies (Osborn & Hagedoorn, 1997; Saxton, 1997) revealed that

time spent on site can bring the person conducting the research closer to the process of interest and increase the awareness of how the potential participants currently frame the phenomenon of interest. In order to accomplish an increased awareness, extensive exposure to the area of interest is required. The constant comparative method used in grounded theory entails a close and ongoing relationship between the researcher(s) and the site (Suddaby, 2006). Suddaby stated, "The quality of contact between researcher and empirical site and the quality of the research produced have a direct relationship" (Suddaby, 2006, p. 640)

Because of this close contact between researcher and area of interest, the researcher must account for his/her own position in the research process. The researcher must engage in constant self-reflection to ensure that personal biases, assumptions, and world-views are taken into account while collecting and analyzing the data (Suddaby, 2006).

Grounded Theory Data Collection

The research process captures all potentially relevant data by carrying out procedures of data collection and analysis methodically and in succession. This process is a major source of the effectiveness of the grounded theory approach (Glaser & Strauss, 1967). In grounded theory, interviews may start with an interest in subjective understandings, but the primary interest is not in the stories themselves. Instead, the stories are a means of eliciting information on the social context of interest (Suddaby, 2006). Grounded theorists collect data to develop theoretical analyses from the beginning of a project (Charmaz, 2006).

To maintain consistency in data collection, the investigator must watch for indications of all concepts in each interaction; concepts that have been carried over from previous analyses as well as ones that emerge in subsequent interactions. Careful noting of qualifiers gives specificity to concepts that are then later developed in analyses (Corbin & Strauss, 1990).

Grounded theory is an interpretive process, not a logical/deductive one, and successful grounded theory has a creative factor. Key decisions about which categories to focus upon, how to collect the next set of data, and the meaning ascribed to the concepts within the data, are made by the researcher throughout the data collection and analysis process (Suddaby, 2006). A key feature of grounded theory is that hypotheses are constantly revised during the research until they hold true for all of the evidence concerning the phenomena under study. A cornerstone of this verification process is a search for both negative and qualifying evidence of the social process of interest (Corbin & Strauss, 1990).

According to Charmaz (2006), grounded theory interviews begin with a general overview question that acts as a catalyst for participants to begin to tell their story. Questions to probe or to follow up are used in order to assure the topic of interest is covered, but generally, the interview is governed by the responses of the participant. Charmaz also suggested that the interviews be recorded with a digital recording device and concurrent written notes be taken during the interview for subsequent use in analysis. The use of a recorder allows full attention to be given to the research participant during the interview as evidenced by eye contact and body language. Charmaz also suggested

that taking notes would be helpful to identify key points during the interview; notes would also remind the interviewer of earlier points, which might suggest logical follow up questions.

Munhall (2007) stated that open-ended questions are those that supply a frame of reference, via the research problem, for respondents' answers, but otherwise put little restraint on the answers and their expression given by the participants. Munhall argued that open-ended questions have important advantages in that they are flexible, they have possibilities of depth, and they enable the researcher to probe deeper into the subject matter. Munhall further contended that open-ended questions could encourage cooperation and achieve rapport between the researcher and participant. Finally, Munhall proposed that responses to open-ended questions could suggest possibilities of relations and hypotheses that may have been unexpected and unforeseen by the researcher, indicating relationships not originally anticipated.

In a process outlined by Kerlinger and Lee (2000), the interview is allowed to grow and shift in light of emerging thoughts and responses of the participant. The duty of the researcher is to lead from the original responses and probe deeper to obtain further clarification. Focused questions are more frequently asked at the beginning of the interview so that in subsequent interviews the concepts of the emerging concepts can be confirmed, expanded, or refined. Kerlinger and Lee (2000) stated that through the data analysis, the researcher could then build upon those concepts with each subsequent interview.

Research-specific Data Collection

Clinical sites. After receiving approval from the Indiana University Institutional Review Board (IUIRB), (see Appendix B for a copy of the approval letter) I contacted the chief nursing officer (CNO) of the first clinical site by email using the IUIRB approved message. I attended one of the monthly nursing managers' meetings at the CNO's request in order to introduce the study to the ICU managers. At that time, I made contact with the nursing manager of the adult critical care unit (ACC). The manager and I agreed upon a time for me to spend in the unit with the nursing staff prior to data collection (as previously outlined in the protocol), which I later referred to as the 'hanging out' period. After I hung out for two days in the ACC, three nurses from this unit agreed to be interviewed individually, which we did in a private, unused office located near the unit.

I contacted the CNO of the second institution through email, who referred me to the leader of the institution's evidence-based practice nursing research council. I was asked to present the research proposal to this council as part of the introduction to the institution. I was then asked to present the proposal to the critical care quality council. At that meeting, I made contact with the nursing managers of the five critical care units in that institution. The nursing manager of the cardiovascular critical care (CVCC) unit was the first to show interest; consequently, I spent two days the following week hanging out in that unit. As an observer in the CVCC unit, I noted that nurses were paired for lunch times, one covering for the other while away, and the lunch hours were protected time away from patient care duties; therefore, performing interviews during that time was feasible. Those interviews were conducted after the hanging out period and they occurred in a private, unused office near the unit.

My next unit manager contact was with the critical care nursing manager of neurological critical care (NCC). The nursing manager was agreeable to my hanging out in the unit for the purpose of this study. From the two units (CVCC and NCC), eight individual nurse interviews were conducted. Although some of those interviews occurred at the hospital, other locations were also utilized to interview and collect data. One location was a conference room in the school of nursing, which was convenient for those individuals who lived in the nearby area. For other nurses who lived on another side of this large, metropolitan city, arrangements were made to use a private conference room inside a community hospital where this study was not in progress.

Once the CVCC and NCC unit interviews were finished, I made contact with the critical care nursing manager of the multispecialty critical care (MSCC) and the adult critical care (ACC) units. Contrasted to the CVCC and NCC, the MSCC was a much smaller unit, which yielded only two interviews. Three additional interviews occurred from nurses in the ACC, taking about four weeks to complete all five interviews.

After contacting the nursing manager of the fifth unit, I was able to spend time in the cardiac medical critical care (CMCC) unit. Over the next three weeks, seven individual interviews were completed. These interviews were conducted in various places both in and outside the hospital; however, nurses' privacy and confidentiality were strictly guarded.

While completing the data collection at the second clinical site, I made contact with a third clinical site's CNO to commence the approval process there. I was asked to attend the hospital's nursing research council (NRC) meeting where I presented my

research proposal. A meeting with the professional practice council (PPC) followed that presentation so that staff nurses from the various critical care units had a chance to hear the proposal.

Subsequent to receiving approval from the PCC, contact was made by email with the nursing managers of the four critical care units within that hospital. One nursing manager responded by asking not to be included because her unit currently had several ongoing studies; she was concerned that another study might overwhelm the staff. I honored her request and spent time hanging out in the surgical intensive care unit (SICU). I then went to the transplant intensive care unit (TICU). Between these two units, eight additional interviews were completed over a six-week period.

Hanging out process. Although the time spent 'hanging out' in each of the different units varied slightly, an overall common process existed. After contacting the individual unit's manager and asking about a preferred arrangement for a meeting time and dress code, I arrived at each unit during mid-morning. Prior arrangements were made for an available staff person to show me around the unit and to provide an introduction to the nursing staff. I introduced myself as a PhD nursing student working on a dissertation; I was there to spend time observing the unit's operations and familiarizing myself with the staff.

After the general tour and introductions, I was left to wander freely around each unit. I approached and spoke to the nurses and took cues from their responses. I also spent time hanging out in break rooms and striking up conversations during the nurses' lunch and/or breaks. Conversations continued as long as they appeared comfortable and had adequate time. Usually, after an initial general topic discussion, most nurses would

ask for more details about the study. Topics would also become more personal, such as one nurse who was going to school for her advanced practice degree, so we discussed the rigors of master's education. Several other nurses were fellow 'dog moms' so that offered a common connection that facilitated my acceptance within the unit.

I arranged to leave prior to the end of the shift to avoid interference with patient care activities during that time. When taking leave of the units, I went around and thanked each nurse for her time and asked those nurses who, at some point in the day, appeared interested in the study if she was willing to be interviewed. If they gave a positive response, I asked for either a phone number or an email as contact information. I told the nurses I would contact them using this method to arrange a mutually agreeable time to meet and to complete the interview.

Within a few days of completing the hanging out time, I sent an email to the units' managers thanking them for allowing me to come into the unit and asking them to forward an email to the entire staff. In the forwarded email, I thanked, in general terms, the nurses with whom I spent time and made note of the fact there were informational flyers left in various locations within the units that contained study information and my contact information (see Appendix D for an example of the flyer).

The data collection process concluded after seven months and six days, wherein I spent time in three separate institutions covering eight different ICUs. That timeframe allowed me to collect the necessary thirty interviews. Data analysis continued throughout the collection time and is related in detail in the next section.

Data Analysis

The following process described for grounded theory research data analysis is one proposed by Strauss (1987), Strauss and Corbin (1998), and Corbin and Strauss (1990, 2008). The basic tenants of this process are: (1) theoretical sampling; (2) memo writing; (3) constant comparison; and (4) formation of categories through (a) open coding, (b) axial coding, and (c) selective coding. These processes often overlap throughout the analysis process but are dealt with separately for purposes of clarity.

Theoretical sampling. In grounded theory study, representativeness of concepts, not of persons, is crucial, and representativeness is achieved through the use of theoretical sampling. The aim of theoretical sampling is to construct an explanation of a specific phenomenon in terms of the conditions that gave rise to the identified phenomenon, to show how the phenomenon was expressed through action(s) and/or interactions, and to note the consequences that resulted from that phenomenon (Corbin & Strauss, 1990). Theoretical sampling is a method of data collection based on concepts derived from the data rather than those established before the research process begins. Corbin and Strauss (1990) argued that theoretical sampling is a method of data collection that sets grounded theory apart from other collection methods. Theoretical sampling is also set apart by the premise that data collection and analysis go hand in hand. The focus of subsequent data collection is based on what had been discovered during the previous analysis with purposeful exploring for indicators of those concepts. Consequently, data can be sequentially examined to discover how concepts vary under different conditions. Corbin and Strauss (2008) stated that the flexibility of theoretical sampling is especially useful when exploring a previously unexplored area of research because of allowances

made for discovery. They argued that theoretical sampling is cumulative in that every sample builds upon previous data collection and analysis. Sampling becomes more specific as the researcher seeks to saturate the category. Corbin and Strauss (1990) stated that to maintain consistency in data collection, indications of all concepts from previous analyses should be sought in following observations as well as an open mind kept to new concepts that emerge in the situation. Every concept brought into the study or discovered in the research process is at first considered provisional. Each concept earns its way into the theory by being present repeatedly or by being significantly absent. Requiring that a concept's relevance to an evolving theory be demonstrated is one way that grounded theory helps to guard against researcher bias (Corbin & Strauss, 1990).

Memo writing. Memo writing is a crucial step in grounded theory research by prompting the researcher to analyze and to code data early in the process (Charmaz, 2006). Writing memos during data collection and analysis describes a system for keeping track of all categories, properties, hypotheses, and generative questions that evolve from data collection. Writing memos is not simply the jotting down of ideas but rather, a key part of the formulation and revision of theory during the research process. Writing memos begins with the first session and continues to the end of the research. Memos become more elaborate and integrated as the theory evolves. Because concepts are sorted and resorted throughout the entire research process, memos provide a firm base. Omitting this step loses conceptual detail and leads to the risk of an undeveloped theory. A grounded theory is generalizable only so long as specific conditions that linked through action/interaction with definite consequences (Corbin & Strauss, 1990).

Constant comparison. During grounded theory research, the incidents, events, and happenings are analyzed as potential indicators of phenomena. Basic units for theory are accumulated by comparing incidents and naming like phenomena with the same term. Concepts that pertain to the same phenomenon must be grouped together to form categories (Corbin & Strauss, 1990). The constant comparative method indicates movement from relatively superficial observations to more abstract categories and is accomplished by interplay between data collection and analysis (Suddaby, 2006). Making comparisons guards against bias by challenging concepts with fresh data. Such comparisons also help to achieve greater precision and consistency (Corbin & Strauss, 1990). A key component of the constant comparative method is the critical evaluation of emerging constructs against ongoing observations (Suddaby, 2006).

Forming categories. In order to become a category, a concept must be developed in terms of its properties and dimensions, the conditions that give rise to it, the action/interaction by which it is expressed, and the consequences it produces. Merely grouping concepts under a more abstract heading does not constitute a category, and not all concepts become categories. Consistency is achieved once a concept has 'earned' its way into a study through demonstrations of its relationship to the phenomenon under investigation. Its indicators should be sought in all subsequent interviews and observations. The newly formed categories are higher in level and more abstract than the concepts they represent. Categories are the cornerstones of a developing theory; over time, categories can become related to one another to form a theory (Corbin & Strauss, 1990).

Coding – open. Open coding takes the data from previous findings and compares them with current data for similarities or differences. Conceptually similar items are labeled and then grouped together to form categories. Once identified, categories become the basis for theoretical sampling; consequently, they stimulate comparative questions to guide the researcher in subsequent data collection. The use of open coding and constant comparison helps to minimize the risk of researcher bias (Corbin & Strauss, 1990).

A component of open coding is a researcher's theoretical sensitivity. Theoretical sensitivity is the ability of the researcher to work with the data in both theoretical and sensitive ways (Glaser, 1978). Theoretical sensitivity reflects the researcher's ability to use personal and professional experiences and the literature to see the research situation and the data in new ways and to utilize the capability of the data for developing theory (Corbin & Strauss, 1990). The researcher can contemplate the data from a distance while at the same time maintain an intimate level of sensitivity and understanding of their involvement in that process. Strauss and Corbin (1998) stated that theoretical sensitivity is achieved using specific analytic tools that include, questioning; analysis of a word, phrases, or sentences; the flip-flop technique; making close-in and far-out comparisons; and waving the red flag.

Coding – axial. Strauss (1987) stated that axial coding is used to understand categories in relationship to each other; hence, the purpose of axial coding is to outline and to disentangle relationships on which the association of the category is being made. Strauss and Corbin (1998) stated that in axial coding, categories are related to their sub-categories, and the relationships are tested against data. This connection is accomplished through the use of a coding paradigm, which focuses on three aspects of the

phenomenon: 1) the conditions or situations in which the phenomenon occurs; 2) the actions or interactions of the people in response to what is happening in the situations; 3) the consequences or results of the action taken or inaction (Strauss & Corbin, 1998). Likewise, further development of categories takes place as the researcher continues to look for indications of the categories, which makes the theory conceptually denser and which makes the conceptual linkages more specific (Corbin & Strauss, 1990). All hypothetical relationships proposed during axial coding are considered conditional until repeatedly verified against subsequent data (Corbin & Strauss, 1990).

Coding – selective. Selective coding, according to Strauss and Corbin is the "process of integrating and refining the theory" (Strauss & Corbin, 1998, p. 143) and occurs in the later phases of a study. At that point, all categories are unified around a 'core' category that represents the central phenomenon of the study. The core category might emerge from among the categories already identified, or a more abstract term may be needed to explain the main phenomenon. The generalizability of a grounded theory is, to a degree, realized through this process in that the more abstract the concepts, especially the core category, the wider the theory's applicability. At this stage, a grounded theory is reproducible in the limited sense that the theory is verifiable. One can take the propositions that are made explicit and test them (Corbin & Strauss, 1990).

Poorly developed categories are most likely to be identified during selective coding. A poorly developed category is one for which few properties have been uncovered in the data or for which a subcategory contains only a few explanatory concepts. These can be filled-in with descriptive detail but are not central to the findings (Corbin & Strauss, 1990).

Research-specific Data Analysis

Interview transcriptions. I made arrangements with an outside agency, Absolute Marketing and Research (AM&R) based in Bloomington, Indiana, to provide linguistic transcription services of the recorded interviews. The company is accustomed to following all university guidelines for eligibility and confidentiality. The digital recordings of the interviews were uploaded on the same day the interview occurred to an on-line Drop Box account held by AM&R. Using this program, files were automatically encrypted until opened by staff at AM&R, who then recoded the file name to a proprietary numbering system to remove potential outside identification. The digital recording was transcribed into a Microsoft (MS) Word© document. This document was returned to my own secure, password-protected email account. The transcriptions were returned within five to eight days. The MS Word file was saved to a password protected computer used by only myself with a file name of the same non-identifying ID number used on the informed consent (see Appendix E for a copy of the informed consent form). I listened to each recording and compared the recording with the transcript to check for errors and to fill in occasional words or phrases not captured by the transcriptionist.

Computer-printed hard copies of the transcripts were used for data analysis. This process began by performing line by line coding of the interviews using gerunds to reflect the nurses' statements. Following completion of the first three interviews, the analyses were sent to members of the dissertation committee for their review and input. Several suggestions were made by this committee regarding means and methods to gain more data from the interviews.

Theoretical sampling. A meeting was held between the dissertation committee members and me approximately one-third of the way through data collection. I reviewed with them the data accumulated to that point and discussed with them how to precede with further data analysis.

My overarching research question was aimed at collecting data from nurses who had 'made, witnessed, or had knowledge of an error'; however, the data set encompassing all three variables was proving to be vastly different between the three experiences. The dissertation committee and I decided at that time to narrow the data analysis focus to only those stories that told of a nurse's own experience with making an error. We all agreed this topic was in best keeping with the overall goal of the study.

After deciding to narrow the focus for data analysis to these specific stories, I returned to the completed interviews and re-analyzed the transcripts to identify those pieces of interest. During subsequent individual interviews, the nurses were still allowed to discuss topics about experiences with errors as they liked with no restriction, but when the opportunity arose, I made an effort to ask about stories of their personal experiences with errors. Most nurses were forthcoming with their stories and told more than one story about their experiences per interview. As the analyses preceded concurrent with the interviews, I was able to ask probing questions in more detail in an attempt to confirm or disprove concepts from previous interviews. This questioning style yielded a richer explanation of the event from the nurses' perspectives, something that is lacking in nursing research.

A few nurses either had no stories of their own experiences with errors or were unwilling to share. Resulting from the lack of stories about their own experiences, five interviews of the total thirty were not used for data analysis.

Memo writing. Memo writing was started as soon as the first interview was analyzed and continued routinely during the analysis process as concepts began to coalesce into similar phenomena. Memo writing was vital in advancing these concepts into potential categories. As new information was elicited from ongoing interviews, previously collected data was re-evaluated and reorganized. Memos were done in free-form writing style either by hand or on a computer, whichever was most convenient as inspiration and ideas struck me. The memos often consisted of questions I had about the meaning of the data and possible links between the categories. The memos also included thoughts and ideas about how to proceed with subsequent interviews to maximize theoretical sampling and how to refine the interview technique.

Memos were fundamental in their ability to communicate my rationale to the dissertation committee regarding how I developed the concepts from the data into the formation of categories. In my communications with the dissertation committee, I would include both the raw data from the interviews and my memos about them to demonstrate how I felt the analysis was evolving and what the codes meant in terms of developing my final outcome. Memos focused on how the concepts, which lead to these categories and then axial codes, related to one another in terms of similarities and differences. Insight into the links between and meaning of the codes was repeatedly acquired using memos.

Coding of Interview Data

I performed manual coding of data from the interviews and began by identifying the stories within the interviews that related a nurse's personal experience with an error event. Once the sections were identified, I completed line-by-line coding of each portion of the story. Open codes were extracted from the line-by-line codes of the raw data, and after completing open coding and constant comparison on multiple stories, several categories began to evolve. These categories were explored with memos and within subsequent interviews.

A second meeting between the dissertation committee and me occurred approximately half-way through the data collection process, and at this time, I decided to move to axial coding. Axial codes link categories together by their theoretical relationships, which I had begun to do in many of my memos at this time. The categories from my data set were condensed and divided into three stages in the process of a nurse's own personal experience with an error event: what occurred before the error happened, what occurred with the telling of the error, and what occurred after the error.

All previously coded interviews were again revisited and re-analyzed in terms of the line-by-line codes and then axial coding into one of the three suggested stages. Memos were used to track rationale for why codes were assigned to each process and how the data evolved as codes were added and subtracted from the processes via constant comparison. I again undertook multiple revisions and tracked the revisions using both handwritten notes and files of MS Word documents. As data collection continued, much

shifting of codes and reorganizing of data occurred as new data was added and previously collected data was re-evaluated in light of new information. This task was accomplished by repeated memo writing exercises.

Data collection and analysis of the interviews progressed in a simultaneous fashion. As analysis technique improved, I realized that not all of my data in early analyses may have been captured; therefore, earlier interviews and codes were again re-evaluated and re-coded as necessary to keep them as close to the data as possible. This reexamination led to a richer data set and the ability to divide the data into more cohesive categories.

A check-in with the dissertation committee occurred at approximately two-thirds of the way through the data collection process. Interviews were reviewed and discussion held about how I could continue to improve the interview technique. Data collected up to that point were reviewed, and the decision to use the three overarching categories of process description was confirmed. Selective coding was discussed as an emerging framework became evident.

Selective coding of the three stages. Categories for the processes occurring before the error event were divided first by common words and then by common themes. The first categories described the state of the environment around the nurse prior to the error. A core element of the nurse being new in some manner was identified. Next, specific errors were separated into their own data group, as were the immediate reactions of the nurses upon realizing the error. In order to break down these responses into sub categories, the root words of the responses were examined and words with common meanings grouped together. *The Roget's Thesaurus* (Bartlett, 1996) was consulted to

assist with finding similar words and expanding the concepts to encompass broader meanings. Finally, actions taken by the nurse to interpret and fix the error were placed into separate categories, which comprised the core element of the error and its immediate actions.

Categories for the processes occurring with the telling of the error were divided first, by whether or not the error event was reported, and for those that were reported, data was divided as to whom was told and the responses of those individuals. Responses were separated by having either a positive or a negative tone. Memo writing was particularly useful here as I tried to identify the essence of the responses and their potential larger meaning to the process. Memo writing was also useful in identifying larger issues of why some events were reported and others were not.

These categories within the process with the telling of the error were eventually revised to focus on the core element of the intent of the error reporting rather than simply the dichotomy of reporting or not reporting. This reorganization was prompted by in-depth discussion with the dissertation committee and yielded a richer data set in terms of why the errors were reported or not. This revision also brought cohesion to the developing theoretical framework and was significant to moving the data analysis forward.

Categories for the processes occurring after the error event contained fewer data codes than the previous two processes simply because there was less data to encode. The data that was available was sorted into two processes: the lack of follow up that occurred

after the error events, and the impact of the error event on the nurses' future actions. A memo was written about the lack of data in this category and the possible meaning and implication of this finding

Summary

This chapter re-presented the research question. The underpinnings of grounded theory were discussed in detail along with how each was applied to the research processes of sampling, data collection, and analysis. Results of the data analysis are presented in the following chapter.

Chapter Four. Results

This chapter presents the findings from the study. The purpose of the study was to investigate nurses' decision-making processes regarding reporting when they made, witnessed, or had knowledge of an error. Initial data analysis revealed the processes among nurses who made, witnessed, or had knowledge of an error were too dissimilar to be included in a singular analysis; therefore, an analytic decision was made to focus on nurses' decision-making processes after they made an error. Thirty adult intensive care nurses participated in individual semi-structured interviews regarding their personal experiences with errors (see Appendix F for a list of questions posed during the interviews). Grounded theory provided the theoretical guideposts for data collection and ensuing analyses.

Interviews

I began the interviews by asking the nurses what they thought of when hearing the word 'error.' Most stated they thought of medication errors, others talked about events that caused patient harm. I then asked the nurses to recall an error-related event that had 'stuck with her.' Most of the nurses related their own error experiences with little encouragement. If they did not, I asked them to focus on their own error experience as the interview progressed. I used reflective statements such as "tell me more about …" or "explain what you mean by …." in order to clarify what the nurses were saying. These reflective questions prompted the nurses to give more details about their experiences. The strength of the recollection was evident in the wording they used and the body language they demonstrated when telling their stories. For example, one nurse began crying

while telling her story. A few nurses were more reticent about sharing their own stories, discussing primarily errors made by others. Data from those interviews were omitted from the current analysis.

The interviews lasted between 40 and 50 minutes. When interviews were ending, I asked the nurses if they had any additional information to share. In response, many shared a few additional thoughts. I then thanked the nurses for their participation and gave them a $25.00 gift card to a major discount store.

Development of the Theoretical Model

Data from each interview revealed a pattern within each of the nurse's stories that represented internalized and personalized change that revolved around three points in time: before, during, and after the error occurrence. This pattern evolved into a theoretical model that illustrates specific processes surrounding the occurrence and reporting of an error and resulted in a theoretical model, entitled "Learning Lessons from the Error" (Figure 1).

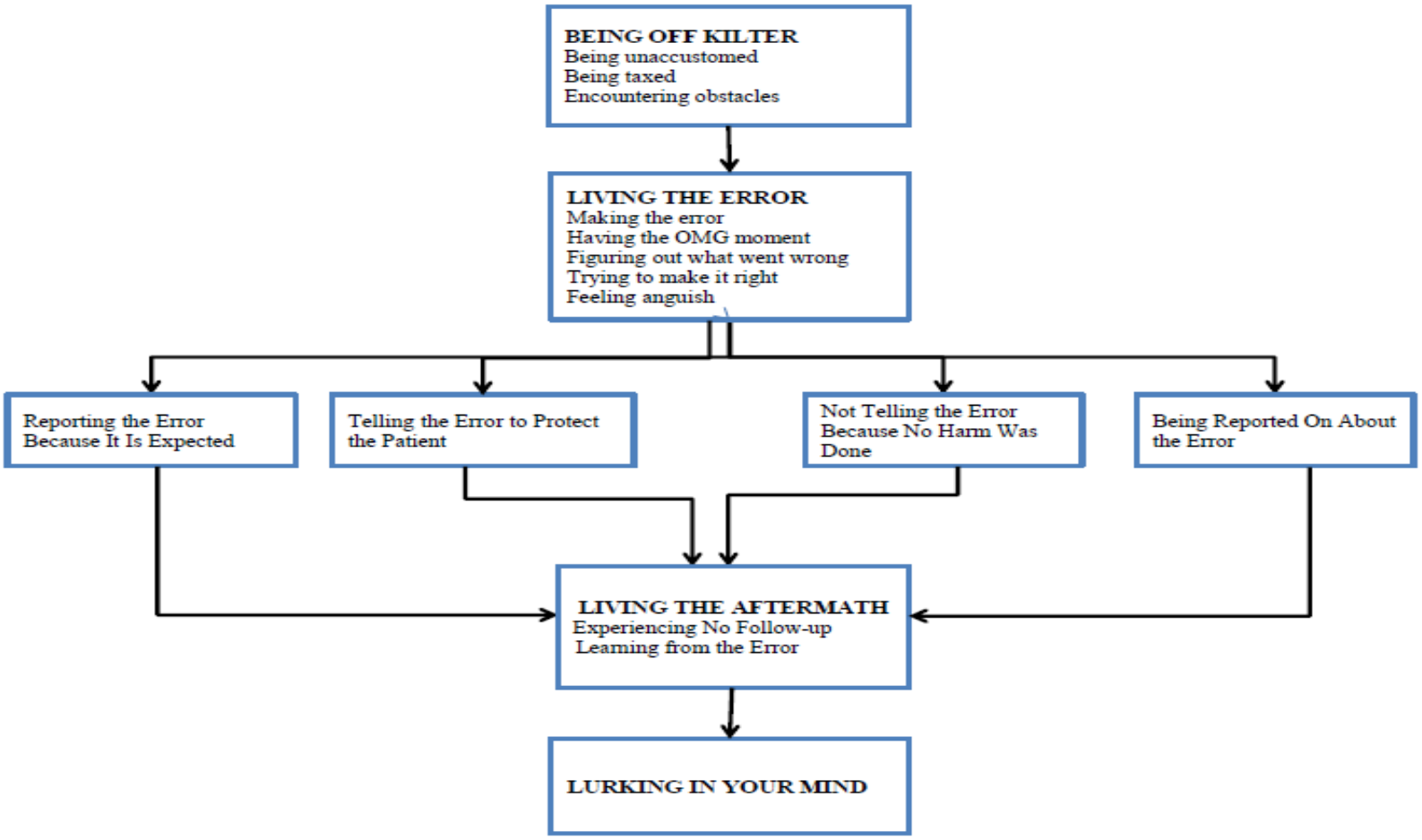

Figure 1. Learning Lessons from the Error. This figure illustrates the theoretical model developed from this study

The theoretical model titled "Learning Lessons from the Error" includes five higher-order categories and 11 subcategories. The higher order categories are: "Being Off-Kilter," "Living the Error," "Reporting or Telling the Error," "Living the Aftermath," and "Lurking in your Mind." These higher-order categories represent common stages each nurse used to process an error. Nearly all the stories began with descriptions of the pre-error situation and ended with enduring personal effects from that error. "Being Off-Kilter" represents conditions surrounding the nurses' work situations prior to the error occurrence. Detailed accounts of the error events and the nurses' immediate responses follow and are labeled "Living the Error." The higher-order category, "Reporting or Telling the Error" covers experiences related to nurses' actions about informing after the error. "Surviving the Aftermath" represents nurses' processes of personal resolution following the error event, and the final higher-order category, "Lurking in your Mind," captures the long-term consequences of the error experience for each nurse. Finally, this chapter concludes with an examination of the core category, "Learning Lessons from the Error" and a description of the theoretical model in its entirety.

In the following section, excerpts are included from interview narratives to substantiate identifiable concepts and relationships within the theoretical model. The data fall into discreet stages for purposes of representing processes that changed over time. Although the stages represented by higher-order categories are common to nurses in this study, one cannot construe chronological sequencing for each of the stages across all participants during a fixed time span following the error. The presentation of data in a sequential manner merely depicts an orderly and predictable process during which variations exist. Just because all nurses experience the same higher-order stages is not an

indicator related to how long or short those stages last or are experienced individually. For example, some nurses experienced the stages simultaneously, while other nurses regressed to earlier stages before moving on in the process.

Being Off-Kilter. The first stage apparent in error-related experiences by nurses was labeled "Being Off-Kilter." The stage of being off-kilter was defined as "not perfectly balanced or even; different from the ordinary, usual, or expected" (Kilter, n.d.). In the majority of nurses' stories, explanations of extraordinarily difficult working conditions prefaced the descriptions of the error. The nurses were off-kilter because they were unaccustomed to the work, were taxed by the level of work, or were impeded by encountering obstacles to the work.

Being unaccustomed. For many of the nurses, the error occurred at a time in their nursing career when they were either inexperienced as a nurse or new to a particular nursing role or work environment. Nurses specified at the time of the error they were "fairly new" and still "learning my new role." Several nurses indicated the error occurred while undergoing or within less than one year of completing their orientation. One nurse stated, "[The] two really dramatic [errors] that I made were pretty early in my career."

The nurses also discussed being out of their normal environment, as when they were "floated" to an unfamiliar unit. One nurse stated that floating to another unit "throws a nurse off her kilter and what she's used to." The nurses were both unfamiliar with the personnel on the unit and were inexperienced in taking care of the dissimilar types of patients on the unit. One "floated" nurse described a patient for whom she was caring who "was getting all kind of weird-named meds I just didn't even recognize."

A 51-year-old nurse with 28 years of nursing experience shared her story:

> Well, this is when I first, first started out and this was within months of graduating and I was in ICU. This is when we did peritoneal dialysis in the ICUs … but for me I had no clue what I was doing … and then I didn't dwell [the dialysate]. I just let it go out. I had no clue what I was doing ... To tell you the truth, I mean I just remember the big event of what I…And I knew I had screwed up. Don't ask me how I knew but I did …

Being taxed. For many nurses, the error occurred at a time when they felt taxed by the demands placed on them, including the need to complete their work in a specified time frame (e.g. the nurses' shift hours). The nurses described their work as "getting super hectic," and they became "really stressed out" because of the need to prioritize multiple tasks. One nurse described the pace as "breakneck speed." This hectic pace was due to having competing priorities, being given heavy assignments, and needing to work in crowded rooms. One nurse summed up the working pace by saying, "it took me about two years before I could actually sit down and take a breath at work … it was crazy."

A 36-year-old nurse with one and one-half years of nursing experience shared her story:

> It's still during orientation, and we had … [a] transplant patient. So we were, it gets, like when you first do it, it gets super hectic and you're gathering all of the stuff. And so we gathered up everything to do and we have like a laundry-list of meds and labs and everything to draw. … They've got pages of stuff where it's like fast. … They do all kinds of testing and lab work. And the meds are ... I can't even remember all of the ones that we gave.

Not all nurses, however, reported they were busy when the error occurred. A few of them described the day as being calm, not having anything significant happening, or having an easy assignment. Some nurses described the errors occurring even when they were simply "doing things we are supposed to [do]."

Encountering obstacles. Many nurses indicated that obstacles in their environment impeded their normal work and contributed to the errors. Examples of these obstacles were issues with equipment being broken, being out of stock, or being kept in an inconvenient location such as "far down the hall." Other examples included an improperly assembled medication set, oral medications that were not well labeled, and computer systems that "went down" and forced the nurses to change to a separate charting system. Nurses described becoming confused when caring for two patients who "looked alike, seemed a lot alike, [and] had a similar story."

The nurses also indicated that obstacles occurred in the context of feeling they did not have access to the help they needed and "there was no one there to ask." They stated they felt they were left hanging "out on a limb." Several nurses indicated there were few experienced or expert nurses available to help them because these nurses were busy with their own work.

A few nurses reported that errors occurred even when they felt they had adequate assistance. One nurse described a medication error that occurred even though she "felt [I] had good resources." Another nurse described a case when the error happened in spite of having the immediate assistance of an experienced colleague.

A 33-year-old nurse with five years of nursing experience shared her story:

> I was in the little cave area and that room is always kind of hard because … you're kind of by yourself, so I don't feel like you have as many resources when you're in that little area. …it's a closed off room. ... Our [medication dispenser] and our tube station … it's always outside the room and it's kind of far, … I think that the [medication dispenser] was broken at the time, and I think that was the only one, because now they're

> all broken. So … you just open the door and you just grab what you need. … On our nurse server that we have in the room, we have [supplies] in there, but I remember I specifically looked and there wasn't any … in that, because we were out on the nurse server, so that's why I had to go in that room in the first place.

Living the error. The name of the second stage, "Living the Error' derived from nurses' descriptions of the act of making the error, the nurses' immediate thoughts upon realizing they had made the error, the nurses' actions involved in searching for what went wrong and trying to make it right, and finally the nurses' experiences of anguish because of the error. "Living the Error" demonstrated how the nurses encountered and passed through the error experience. The word 'living' rather than simply 'experiencing' was chosen to convey the deeply personal nature of these stories about error experiences.

Making the error. When recalling specific errors, the overwhelming majority of nurses spoke of medication errors and was able to recall vivid details of the experience. Examples of medication errors included administering medications by an incorrect route, giving a patient the "other person's dose," and committing omissions in delivery. One nurse elaborated on her experience, saying "I mean not only was it the wrong med, it was the wrong patient, completely wrong." The nurses who did not share stories about medication errors instead relayed experiences with self-extubations, falls, and lab errors.

A 24-year-old nurse with one and one-half years of nursing experience shared her story:

> I forgot to unclamp my piggyback so the medication was given like way, because our [specific medications] go all day, so I had been giving my patient boluses of normal saline instead of the [specific] medication. … We did the bedside reporting, and …she asked me, she said … your medication is still full; do they need this? I'm like, yes, they absolutely did.

Having the OMG moment. When asked what their immediate thought was upon realizing the error, the majority of nurses said "oh my God." Expressions following this were statements commonly involving profanity, especially the phrases "oh shit" and "crap." Even without profanity, the reactions were extreme as one nurse described her experience as if she were "in panic mode." One nurse was especially candid with her story when she confessed, "My initial reaction was to lie. I wanted to lie and say, no, absolutely I didn't [make the error.]" She told me it was "one of those moments where you feel about two inches tall."

A 38-year-old nurse with 14 years of nursing experience shared her story:

> In the room, we were talking about the new medications and stuff he had started, how much IV medication he had had, and I mentioned [a specific drug]. It was then that something was said like, well, you surely didn't [deliver it incorrectly]? Then it just hit me … I could have passed out. I mean honestly I was so sick to my stomach … I'm just sick telling you about this.

Figuring out what went wrong. Nurses identified an awareness of an error having been made when something about the patient or situation "just wasn't clicking." Often the deciphering took multiple steps and involved reviewing previous actions, establishing a timeline, and putting "two and two together." As part of untangling the events, nurses would relive the last several moments of time and "retrace [their] steps" either mentally or physically in order to discover how the error began. "There's just a lot of questioning about how [the error] happened."

A 25-year-old nurse with two years of nursing experience shared her story:

> Well I had never made a med error before so I was just like, oh my, gosh, why, why did this just happen, and I was like … I don't even know what this medicine is. So I'm like Googling it trying to figure out what it is …

Trying to make it right. Nurses described efforts to correct their errors. As one nurse told me, "All I could think about was making it right" and asked herself "what can I do?" Correcting the error generally required only minor actions, such as adjusting or stopping a medication dose, or redoing a procedure in the correct manner. One nurse described how she was "able to correct [the error]" and continued on her normal routine. Nurses tried to undo actions, such as trying to withdraw incorrect medications from a nasogastric tube or intravenous port after the medications was given. Another nurse was conscientious about preventing future errors by removing an incorrect stock item to avoid having a colleague repeat the error.

A 63-year-old nurse with 28 years of nursing experience shared her story:

> I needed to draw labs and … it was those two rooms, but instead [of going into room A] I went into [room B] and sent [labs on the patient in room B]. As I was sending them, I realized my mistake. … I called the lab. I redrew the labs on the correct patient [in room A]. Everything worked out. You know the wrong labs were discarded. I got new labels. I went into the right room and the right person and drew my labs.

Feeling anguish. Universally, nurses' reactions to the error reflected guilt and self-blame. The majority of nurses were quick to blame and berate themselves for allowing the error to happen. One nurse summed up the majority sentiment by stating, "I felt like an idiot [that] I let [the error] happen." Along with feelings of self-blame were the emotional impacts of the error being "upsetting" and nurses describing how they were so "emotional" after the error occurred. One nurse elaborated, "I freaked out [and had] to

step away for a minute." These feelings often persisted throughout the day of the error to the extent that nurses questioned their own abilities. The nurses' primary fear related to being afraid of having a devastating outcome in which the nurse "could have killed [the] patient."

A 24- year-old nurse with two years of nursing experience shared her story:

> In my mind I was panicking. I wasn't sure who to call first. She was obviously fine but still I didn't know what would happen down the line because I was fairly new at this point. So here I am thinking I have been a nurse for a few months and I am already making a mistake. ... But at first I was just kind of in a panic, like what if something happens to her? What if I lose my job? Because I had worked so hard to get here. ... And obviously I cared about her more than about me because if something happened to her it would have messed me up anyway I feel like emotionally.

Reporting or telling about the error. The third stage, "Reporting or Telling about the Error" was derived from nurses' accounts about who (if anyone) was informed about the error and for what purpose. The distinction between 'reporting' and 'telling' the error evolved from data about the nurses' intent of disclosure. The word 'reporting' depicts the nurses' intents to produce a formal record of the event. In the case of medical errors, a formal record was generated by the hospital's incident reporting system. In some of the nurses' stories, the intent of the disclosure clearly reflected adherence to a formal reporting mechanism, especially if the nurses shared an experience where there was clear expectation of formal reporting. In these instances, the reporting was done with little consideration.

In contrast to the formal intent of reporting was the less formal act of 'telling' about the error. In the case of telling someone else about the error, the inclusion of a formal report was not implied, especially if the nurses felt the expectation of reporting was not clear in the particular situation. In these nurses' experiences, the error was

verbally reported to the immediate persons involved, but a formal report was not expected. Instead, the nurses talked about telling the error in the interest of protecting the patient and potentially correcting the error.

In addition to the acts of reporting or telling about the error were stories relating instances when no one was informed about the error because the nurses perceived that no harm was done to the patient. Finally, a small group of stories was included regarding nurses being reported on by someone else following an error. These four groups were qualitatively different in both their intent and outcome.

Reporting the error because it is expected. Nurses conveyed how reporting certain types of errors had become "very standard" where they worked. Commonly reported errors either were related to quality improvement projects or were a type of error being "tall[ied]" by the unit. Nurses stated that "[management] have really drilled home" the need for error reports in certain situations, and the nurses described a routine completion of an error report "just because that's the policy." Even when the error was not considered a threat to the patient, nurses felt they "had to write an incident report … because it's mandatory."

Expectations of reporting also came from persons with supervisory or mentoring responsibilities over the nurses. Charge nurses and nurse preceptors were often identified as primary influences on the nurses' expectations of reporting. A common response when reporting errors to a charge nurse was "write it up," and other nurse leaders were noted to routinely encourage the nurses to "report [the error] and not just change [the problem]." Often the nurse leaders offered assistance with completing the report, as one nurse told me how her nurse mentor assisted her with completing an error report.

Only one person related an error that was not reported when a supervisor or preceptor was aware of the error. A nurse stated "No. It wasn't [reported]. We never really discussed it, to be honest."

A 28-year-old nurse with one and one-half years of nursing experience related her story:

> ...when we told [the charge nurse] about [the error] she was like, okay, just make an incident report. ... [the shift coordinator] was like, well, make sure you go through the steps. … I think it was more like learning a lesson having to do it … like they let me go through the process of actually doing it and stuff.

Telling the error to protect the patient. Some nurses' stories specified that telling the physician or another medical staff person about the error was done with the intent of identifying if there was a need for corrective actions following the error. One nurse acknowledged, "I knew that if I told [the physicians] ... that maybe there would be something that we could do" to correct the error. Another nurse rationalized telling the physician in order that the medical team could "change the [medication] regimen" as necessary. Nurses felt they "had to call" the medical team so that staff had appropriate information upon which to act.

After being told by a nurse about an error, expectations of reporting an error differed between the nursing management and the medical staff. Nurses described experiences in which they told the physicians about the error and "that was it." Interventions were rarely necessary, and nurses indicated the physician simply told nurses to "watch" the patient. Nurses related that physicians were often dismissive of their reporting the errors, saying to the nurse, "we're not going to doing anything about it…just

document it or whatever." Occasionally the nurses themselves discounted the need for an error report, stating "I called the doctor and to me that is my incident report."

A 55-year-old nurse with 27 years of nursing experience shared her story:

> … it's been like ten years ago… The patient was in trouble and I was an orientee... [My preceptor] said go get me a bag of … norepi, and I think I grabbed epi, and it got hung… but I just went to the surgeon and I said this is what happened. I got her the wrong drug. …I told him this is what I've done. This is what got pumped. I said we corrected it and I can guarantee I learned from it and it won't happen again. … He patted me on the back and said don't worry about it. Everything is fine. The patient didn't get hurt. …I said I will write this up, and he said no, don't. I said the policy is write it, and he said don't do it, so I didn't.

Not telling the error because no harm was done. Nurses revealed that the reason errors were not reported in the majority of cases was because there was no patient harm caused by the error. Nurses shared they could assess that the patient was "going to be fine" after the error and this deterred them from reporting the error. Instead they "just let [the error] go." While none of the nurses indicated they actively hid the error, some nurses shared that completing an error report did not occur to them as being necessary because "nothing happened." Other reasons for not reporting the error included being too busy, being afraid of possible ramifications of reporting, and being deterred by the amount of time the reporting required. Rather than report the error, one nurse told me, "I kept [that error] under my hat."

A 25-year-old nurse with three years of nursing experience told her story

> I guess it never really crossed my mind. No, no report [was made]. None of the charges really said, "You need to report that." Because it got interrupted before it got to the patient which doesn't always happen.

Being reported on about the error. A small but qualitatively different group of nurses' stories illustrated the experiences of nurses who made an error but were reported on by someone else. These few nurses described being "called into the office" and receiving punitive responses to their error, including being "scolded" and being told that if they accrued another error "it will become a big deal." One nurse shared that she was told she would "have to be good" for a period of time following the report. Another nurse told her story, and the conversation she had with the charge nurse who followed up on the incident. The charge nurse first asked her, "why did you [do] it?" Finally, one nurse described how she was reported on for not checking equipment and was told "you need to watch out." This nurse also added "I still think [error reporting] does occasionally feel punitive."

A 33-year-old nurse with seven years of nursing experience shared her story:

> The next day, I walk in and various…charge nurses and managers …they were like, hey, we need to talk. I'm like oh crud. … you know that's never a good lead in. That's when they handed me the little incident report. But anyway they told me, hey, you need to be careful. I was like I scanned [the medication]. They're like we know you did. That's the problem but this is the outcome. [The patient] was fine and it was an under dosing. However, it's your error; you missed it. You were the initial, you were the instigator or the point of contact with that medication and so it was your responsibility to check it.

Living the Aftermath. The fourth stage in the theoretical model was labeled "Living the Aftermath" and arose from nurses' narratives describing the time period that followed the reporting or telling of the error. The aftermath of an event is defined as "the period of time after a bad and usually destructive event" (Aftermath, n.d.). The connotation of 'living' the aftermath signifies enduring the effects of the errors described by the nurses, effects lasting well beyond the time frame of the error itself. Nurses shared

stories about errors that had very personal meaning to them, and their descriptions of achieving resolution of that error experience were very personal and individualized as well. Most nurses' stories highlighted a scarcity of information about follow-up once an error event was reported or told to someone, and the majority of nurses shared that acquiring knowledge from the error experience helped them to reach resolution following the event.

Experiencing no follow-up. Nurses indicated that absence of follow-up left them to reconcile the error alone without assistance. "No one ever followed-up" was reported by several nurses in the study. A large gap existed between the experiences of personal anguish described by the nurses and their reports of institutional follow-up after the error. One nurse summed up the majority sentiment saying, "I think maybe someone would ever one day care about what happened and ask me, but nobody ever does." Most nurses experienced no follow-up in any format and told me there was "absolutely nothing" said to or done for them after the error experience. Some nurses expressed an expectation of getting "in trouble or something" but reported that this never ensued. Nurses in this study shared that discussion about the error was sometimes left to chance, because as one nurse stated, "If they want to find out [I was involved] they'll be able to find out, [but] nobody approached me."

Two nurses shared in their narratives that they did receive corporate recognition following the reporting of an error, but the recognition held little meaning for them. One nurse told of receiving a card that contained a message she felt said "thank you for erroring [sic]." This same nurse also reported recognizing the difference between the frequency of her error reporting and the infrequency of receiving these cards. Another

nurse described receiving a card but then declared there was "nothing ever followed up with [the error]." As her statement implied, even receiving this type of card was not, in her mind, a follow-up.

A 55-year-old nurse with 29 years of nursing experience shared her story:

> I think by the end of the day when I realized the patient did not die from it … and I didn't realize until the end of the day when I was going home that she [nursing manager] hadn't said any more about it or done any more and it was never mentioned again… No, she never said another word about it… she never brought it up again.

Acquiring knowledge from the error. Nurses' portrayals about acquiring knowledge from the error reflected they felt something positive emerged from this personally traumatic experience. Nurses reported an increased awareness in their work after the error experience "made me realize how important things are and how … you need to pay attention." The knowledge gained was described overall as the nurses learning "to be more careful" and avoiding a repeat of the same error. The nurses believed that if they learned from the error then they were unlikely to repeat the error in the future.

Acquiring knowledge from the error in order not to repeat the error was also supported by the majority of nurses who said, "I have not made a mistake like that since." Some nurses indicated the error lead to changes in their practices, as one nurse described how she changed her morning routine after an error. Nurses who had experienced an error event and its impact recognized the chance for other errors to occur in the future and that some errors could result in patient harm. "I guess [experiencing the error] was

positive … because I am even safer than I tried to be before." Other nurses illustrated how the error led to finding new means of organizing their patient information or to changing a unit's policy.

A 36-year old nurse with six years of nursing experience shared her story:

> That's not a mistake that I think I will ever make again. I will always, always, make sure that it is [the correct one] … And I do. I still do… just so that mistake's not made … [and] just to help another person not to make the same error …So I mean it's a good learning experience. … I feel good about that and I feel good that that's not a mistake that I'll make in the future.

Lurking in your mind. The final stage in the model is 'Lurking in your Mind' and represents nurses' expressions of memories and emotions recalled about the error event. To "lurk" is defined as "to be in a hidden place: to wait in a secret or hidden place especially in order to do something wrong or harmful" (Lurk, n.d.). In their stories, nurses revealed errors they "still think about" and described the experience as one "that stay[s] with you." Even those error events when no harm came to patients, nurses expressed that the experiences continued to "bother" them. "I thought about that moment for weeks." One nurse surmised, "I've made mistakes over the years that have brought me to where I am today."

A 42-year-old nurse with 19 years of nursing experience shared her story:

> I recall probably five or six years ago [a medication error]…. I'll never forget stuff like that. … I even remember what room it was in, bed [number]. That stuff is imprinted in your mind. For my orientees …that's one that I bring up as an example. Learn from my mistakes. … That one will always stick with me. … It plays a role in my day-to-day care because … I will never ever forget stuff like that.

Core Category

The core category of the model is 'Learning Lessons from the Error.' In grounded theory, the core category is the phenomenon that organizes the framework and accounts for the variation in the data (Corbin & Strauss, 1990). In this model, Learning Lessons from the Error ties together the categories of: Being Off-Kilter, Living the Error, Living the Aftermath, and Lurking in your Mind. The nurses' stories were primarily about how they learned from the experience of the error and how the lessons they learned remained with them throughout their nursing careers.

The category of 'Being Off-Kilter' was primarily about the nurses' vivid recollections regarding the time and setting prior to the error. The nurses made efforts to describe the busy pace of the day's work or how equipment was broken or unavailable, seemingly to understand the unique circumstances that led to the error. Descriptions of the errors' contexts were reflections of the nurses' attempts to make sense of and to learn from the error.

These phenomena of learning lessons from the error were also apparent while the nurses were 'Living the Error.' The emotional impact of realizing the error left a long-term impression on the nurses, evidenced in nurses' body language, voice changes, facial expressions, and physical manifestations observed when the nurses recalled the error even years later. During this stage, nurses were invested in deciphering why the error happened. By understanding the genesis of the error, the nurses were able to begin to fix the error and also to ensure they would not make the same type of error again. The nurses worked to avoid the emotional distress associated with committing an error; therefore,

they needed to identify their culpability within the error experience. Finally, even though the error was resolved and the patient unharmed, the nurses continued to express doubt and self-blame about their ability to be a nurse.

Learning lessons from the error was also apparent in the stage of 'Living the Aftermath.' Many nurses discussed the knowledge acquired because of the error and discussed how the knowledge led to changes in their daily routine or practice in order to avoid a repeat of the error. Several nurses bemoaned the lack of follow-up after a reported error, reasoning that, without follow up and institutional acknowledgment of the error, no process was in place to prevent similar errors from occurring.

The lessons learned from the error "stayed" with the nurses as was evident in their description of 'Lurking in your Mind. All nurses were still troubled by the error; however, through reflecting on the context of and acquiring new knowledge from the experience, they believed that some benefit came from the error because of the lessons earned. The nurses believed the error contributed to their self-concept as experienced nurses. Importantly, the lessons learned served to make the nurses more cautions and aware of situations that might lead to future errors; therefore lessons learned from the error contributed to developing maturity as a nurse.

Conclusion

Findings from the study were presented in this chapter. Inquiry focused on nurses' decision-making processes regarding reporting when they made an error, and data from thirty interviews were presented and analyzed. Occurring first was the development of higher-order categories (Being Unaccustomed, Living the Error, Reporting or Telling the Error, Living the Aftermath, and Lurking in Your Mind). A discussion of the sub-

categories (where applicable) followed next with specific, detailed examples from the interview narratives. Interviews revealed that nurses shared common experiences before, during, and after the error experiences. Overall, the process of making the error and of the recovery from the error led to a fundamental change within the nurse that persisted throughout their nursing career.

The next chapter contains a summary of the study, discussion of the findings, implications for practice, recommendations for further research, and the conclusion. Concepts discovered in this research are expanded upon in order to provide a further understanding of their possible influence on the process of reporting medical errors and are presented to suggest further research opportunities targeted at improving error reporting rates.

Chapter Five. Summary, Discussion, and Conclusion

The preceding chapter reported the analysis and presentation of findings. Chapter Five consists of a summary of the study, discussion of the findings, implications for practice, recommendations for further research, and the conclusion.

Summary of the Study

My study was based on the research question: What are licensed nurses' decision-making processes regarding reporting when they believe they have made, witnessed, or have knowledge of an error? The research question was explored using grounded theory as the research methodology. Grounded theory (GT) methodology developed an integrated set of categories that provided a theoretical explanation of the social phenomena under study. By using GT, this study sought to identify the nurses' multiple responses to that error, which included the decision about whether or not to report the error.

Data analysis resulted in a theoretical model, entitled "Learning Lessons from the Error," which depicted how nurses in my study described the process of the error experience. Within this theoretical model were five higher-order categories. "Being Off-Kilter" was developed from data codes pertaining to factors nurses described about both themselves and the surrounding environment at the time of the error. Three distinct sub-categories emerged within the 'Being Off-Kilter' category: being unaccustomed, being taxed, and encountering obstacles. The second category, "Living the Error" derived from data codes representing the process of making the error and the nurses' immediate responses to that error. Sub-categories represented how the nurses passed through each phase of the experience, beginning with 'making the error,' followed by 'having the

OMG moment,' 'figuring out what went wrong' 'trying to make it right' and 'feeling anguish.' "Reporting or Telling about the Error" emerged from data codes about who (if anyone) was informed of the error and for what purpose. The fourth category in the theoretical model was labeled, "Living the Aftermath" and included two sub-categories titled 'experiencing no follow-up,' and 'acquiring knowledge from the error.' "Lurking in your mind" described how the nurses carried the experience with them.

The concept of learning resonated throughout the categories of my theoretical model. Descriptions of the errors' contexts and origins were reflections of the nurses' attempts to make sense of and to learn from the error and ensure they would not make the same type of error again. The lessons learned from the error served to make the nurses more cautious, to prompt changes in their practice, and to increase awareness of situations that might lead to future errors. Statements throughout all interviews clearly indicate that learning lessons from the error was a commonly shared experience.

Discussion of the Findings

This study extended what previous researchers have contributed in several areas. My findings represent nurses discussing real-world situations and actual events, rather than fictional scenarios as other researchers have presented (Espin, Levinson et al., 2006; Espin, Regehr et al., 2007; Lawton & Parker, 2002; Meurier et al., 1997). The interviews in my study were performed one-on-one and in a private setting, not in a focus group setting (Jeffe et al., 2004). Findings reported here extend the scope and breadth of those findings reported by other researchers who did not differentiate between reporting and telling and instead considered an error reported in the instance that anyone was told about the error, whether a formal report was made or not (Elder et al., 2008; Covell & Ritchie,

2009; Crigger & Meek, 2007). My study design allowed nurses to describe their decisions about reporting in their own words and therefore extended those findings of other studies which relied on Likert scales and/or questionnaires (Ahern & McDonald, 2002; Evans et al., 2006; Meurier et al., 1997; Stratton et al., 2004; Taylor et al., 2004; Uribe et al., 2002). The following sections contain a more in-depth discussion of specific results from this study and represent findings that go beyond those reported in previous research.

Learning lessons from the error. The major finding of this study - nurses' most salient experience was 'Learning Lessons from the Error' - resonates with literature on adult learning and clinical judgment in nursing.

By learning lessons from the error on their own and without the support of the institution, the nurses in this study cast themselves as adult learners. Tenets of adult education theory state that adult learners are most effective when tasked with applying their experiences and knowledge to solve real-world problems. Adult learners are self-directed and internally driven toward solving thoase problems, especially if the goals are perceived as relevant, realistic, and important (Billings & Halstead, 2005). The learning identified within the stories from my study reflects these basic assumptions. For example, errors are real-world problems that occur in nurses' professional roles. Actions undertaken by nurses to understand and to correct the error illustrate the problem-centered mindset of an adult learner. If reporting an error was perceived to be relevant and/or important to either the nurse herself or the unit development as a whole, then the nurses reported the error with little consideration.

One aspect of learning a lesson from the error is not consistent with adult learning theory. Adult learning theory indicates that adult learners prefer to be connected to and supportive of each other during the learning process (Billings & Halstead, 2005). In my model, nurses were most often left to live with the aftermath of the error alone and without assistance from either their colleagues or the nursing management. This finding illuminates a potential avenue of future exploration; that is, how to provide optimal support for nurses as they learn lessons from the error in manners which are consistent with adult learning.

The experience of making an error can be understood in light of the model of clinical judgment as proposed by Tanner (2006). Tanner defined clinical judgment as "an interpretation or conclusion about a patient's needs, concerns, or health problems, and/or the decision to take action (or not), use or modify standard approaches, or improvise new ones as deemed appropriate by the patient's response" (p. 204). Tanner described differences between clinical judgment, critical thinking, and clinical reasoning. Critical thinking and clinical reasoning focused on cognitive processes relative to a clinical situation, while clinical judgment incorporated the cognitive processes with psychomotor and affective processes. This combination manifested through the nurses' actions and behaviors while caring for their patients (Victor-Chmil, 2013). Clinical judgment required knowledge derived from both science and theory and was based on the nurse's reasoning pattern. A reasoning pattern is developed when nurses consider their perception of the situation, including the political and social context, the difficulties of the situation, and the goal of patient care.

Tanner's Clinical Judgment Model included four phases. The first step was termed 'noticing' which was a function of what nurses expected to find within a given situation. The expectations derived from nurses' knowledge based on past experiences as well as their knowledge of a particular patient and his/her normal reactions. According to Tanner (2006), nurses described "knowing the patient" (p. 206) as central to making clinical judgments. The second step of the Tanner model was 'interpreting,' which occurred when the nurse developed the understanding that a situation had not gone as expected. Noticing an aberration triggered one or more mental reasoning patterns that assisted the nurse with interpreting the information. The next stage of the model was 'responding' which occurred when nurses decided if intervention was necessary and, if so, what form of intervention to pursue. Nurses may have responded based on either a hypothesis derived from assessment and interpretation of the situation or an intuition by applying tacit knowledge. The last stage was 'reflecting,' which was an assessment of how patients responded to a nursing intervention and an assessment of any need for adjustments in the care. Reflection demonstrated that nurses gained knowledge and incorporated the knowledge into their personal development within the nursing role. Reflection influenced nurses' clinical judgments in the future (Tanner, 2006).

The stages in Tanner's (2006) Clinical Judgment Model mirror those discovered in this study. Nurses in my study 'noticed' things in their environment that were not anticipated or desired, leading the nurse to 'Being Off-Kilter.' When nurses put the course of events together and 'interpreted' the situation, this resulted in the realization of an 'OMG moment.' Nurses 'responding' to the error with an intervention aligned with my process of 'trying to make it right.' The processes of 'Living the Aftermath' and

‘Lurking in your Mind,’ demonstrated ‘reflection’ according to the Clinical Judgment Model. Nurses in my study told of how memories and reminders of the error impacted their future clinical actions. Yet, much of this reflection was not shared with others. The use of the Clinical Judgment Model may offer a new way to study, understand, and intervene on nursing errors.

Nurses’ reactions to the error. Another finding of my study involved the actions described by nurses following an error. These actions reflected a desire for positive resolution of the error, depicted through descriptions of the time and effort they spent ‘figuring out what went wrong’ and ‘trying to make it right.’ These findings added to the literature about nurses’ reactions to errors and demonstrated a previously unexplored stage in nursing error management. In my study, nurses demonstrated this problem solving by attempting to decipher the origin of the error. My findings extended studies by Crigger and Meek (2007), Scott et al. (2009), and Lewis, Baernholdt, and Hamric (2013). These authors’ studies, which were reviewed in Chapter Two, did not represent this stage in either of their models. Crigger and Meek (2007) and Scott et al. (2009) instead emphasized nurses’ issues with personal reflection and integrity and noted that, following realization of the error, many nurses were “not … able to think coherently” (p. 327). Nurses in my study did not describe such confusion and instead spent significant energy focused on correcting the error for the patient. This finding was distinct from the findings of Crigger and Meek (2007) in whose study the act of ‘trying to make it right’ was tied into the nurse’s attempt to regain a sense of self-worth. Scott et al. (2009) also did not discuss the actions of a nurse correcting the error; rather, their study focused on restoration of the nurse’s personal integrity. Finally, these findings contrasted with those

of Lewis et al. (2013) who discussed how 'making it right' was tied to disclosure of the error to patients.

Viewing the error experiences through the lens of the construct of resilience was a means to expand the understanding of nurses' responses to an error. Resilience was defined as an individual's ability "to adjust to adversity, maintain equilibrium, retain some sense of control over their environment, and continue to move on in a positive manner" (Jackson, Firtko, & Edenborough, 2007, p. 3). Positive adaptions were demonstrated by nurses who were able to sustain their well-being even in the face of workplace adversity (Hodges, Keeley, & Grier, 2005). Workplace adversity was identified as any situation or episode in a workplace setting perceived to be difficult, stressful, or negative (Jackson et al., 2007). In confronting workplace adversity, resilience focused on the dynamic process used by nurses to access resources in order to recover from the adversity.

The scenarios described by nurses in my study mirrored descriptions of workplace adversity. The experiences of the error and its aftermath were difficult and stressful for the nurse. Nurses demonstrated mental and physical actions to access resources that allowed them to problem-solve the error and evaluate the success or lack of success in the outcome. These actions represented a resource for future learning about error management that has not being utilized. Viewing these findings through the lens of the construct of resilience implied that nurses might be an essential part of follow-up investigation into an error, and a critical component for future learning.

Lacking one-on-one follow-up after the error. The complexities of the healthcare system and the system gaps were inherent in nurses' stories of their own error;

however, a focus on the system was not apparent in the follow-up of the errors as experienced by the nurses in my study. The nurses instead described an absence of follow-up by anyone from the organization. The majority of nurses in my study reported they experienced no follow-up from anyone in a nursing leadership role following reporting or telling others about the error. These results were consistent with those studies first introduced in Chapter Two which specified barriers to reporting and identified feelings that reporting errors was 'wasted' time because of the lack of follow-up (Elder et al., 2008; Evans et al., 2006; Jeffe et al., 2004). Other authors reported that when there was a lack of feedback, nurses became apathetic and reluctant to report (Firth-Cozens, Redfern, & Moss, 2004).

In contrast, other research focused on efforts to increase reporting has demonstrated usefulness of follow-up data as a key to improving reporting. These efforts included purposeful follow-up after reporting, involvement of nurses in root cause analysis activities, and visible executive leadership support (Kaplan & Fastman, 2003; Gandhi, Graydon-Baker, Huber, Whittemore, & Gustafson, 2005). Within the stories related by nurses in my study, no one in a nursing leadership position asked the nurse for details of the error and no move was made by nursing leadership toward using those details to prompt changes within the system.

Attempts are being made to change these practices. Ilan, Squires, Panopoulos, and Day (2011), in an effort to increase error reporting within their ICU, developed a new reporting process which included regular feedback from either the nurses' manager in a one-on-one setting or by the organization's safety committee on a larger scale. In a similar manner, Cochrane et al. (2009) established a Patient Safety and Learning System

(PSLS) which was designed to support nursing managers' rapid responses to error reports. The managers were able to engage the nurses in recalling the error while details were fresh in the mind, and the managers were encouraged to invite those nurses who reported errors to become involved in both solving problems and tracking post-error changes. By providing immediate feedback to and encouraging involvement by the reporting nurses, the authors felt the system allowed them to "close the loop" (Cochrane et al., 2009, p. 152) of the reporting processes.

"Closing the safety feedback loop" was a phrase also used by Benn et al. (2009, p. 11) in their research into methods of successful feedback practices. The phrase referred to the practice of using data from error reports to improve the safety of clinical work systems at the front-line (Benn et al., 2009). It was theorized that changes in the work systems will reduce the likelihood of future errors and contribute to institutional resilience (Reason, Carthey, & deLeval, 2001). Feedback that was both timely and effective reassured nurses that their reports did not end up in a 'black hole' (Benn et al., 2009) and influenced adoption of and compliance with reporting recommendations and practices (Kaplan & Fastman, 2003). The cyclical process of the safety feedback loop was considered closed only at the time when a report was made back to the original reporter detailing the actions that followed from the error report (Benn et al., 2009).

Findings in my study illustrated that effective, formal processes to gather nurses' error stories and to use those stories to promote learning were not yet in place at the bedside level. Literature demonstrated strong theoretical evidence that follow-up after an error occurrence should be an important focus of the error reporting process; however, as demonstrated by nurses in my study, this follow-up did not happen on their level.

Literature also supported that without error follow-up reaching the nursing level, organizational learning from the error cannot be achieved.

Lacking organizational learning from the error. The nurses in my study agreed that sharing the details of errors in order to promote learning within the organization would have been important to them; however, such sharing of error information was not revealed in this study. Information sharing is critical for organizational learning as noted by Benn et al. (2009). However, organizations control the availability of just what information was shared. Benn et al. (2009) discovered considerable discrepancies among the feedback mechanisms employed within various reporting systems. The reporting systems varied in terms of both the preliminary responses to error reports and the promptness to which an intervention followed the error report. Some authors identified that prompt and effective feedback within an organization resulted in as much as ten-time increase in the number of errors reported (Kaplan & Fastman, 2003). Farley, Haviland, Champagne, et al. (2008) performed a survey to obtain baseline information on the characteristics of hospital reporting systems, and their goal was the identification of a link between error reporting and system improvements. These authors concluded that hospitals' responses to reporting varied greatly, and reporting systems typically did not result in system change. Of the healthcare organizations that generated summary reports of errors, 30% of respondents stated they did not disseminate the data within the hospital system. The lack of sharing of data from error reports reduced the opportunities for systems to make changes to improve patient care. Farley, Haviland, Haas, et al. (2012) repeated the study and compared results with those of four years previous. Their 2012 study's data revealed that approximately 35% of the participating hospitals failed to

disseminate summary error reports. Thus, although the literature recommends more sharing of data, it would appear hospitals have drifted in the opposite direction thereby further limiting facilitation of any institutional/organizational learning.

The implication of this finding is that while clearly identified systems for reporting error are in place, a nation-wide adoption and adherence to any such reporting system remains elusive. Ilan, Squires, Panopoulos, and Day (2011) worked to correct this failure to adopt a reporting system by developing a SAFE (safety, action, focus, everyone) committee within their organization. This committee was tasked with expediting error reports and communicating interventions back to those who reported the error. This committee also published resultant changes from reported errors at the system-level through a company newsletter. In another organization, Flemons and McRae (2012) described the development of 'reading groups' within their organization which joined groups of persons from a variety of levels within the organization to review error reports and to collaborate in identifying necessary system fixes. The reading groups' actions were published within the hospital-wide patient safety newsletter. These two studies are examples of organizations' attempts to correct patient safety threats at a system level and maximize "collective contextual learning" (Mikkelsen & Holm, 2007, p. 3) which occurred when nurses were able to experience and to apply solutions to problems based on real clinical situations (Nelson et al., 2002). This education may also influence nurses' resilience (Grafton, Gillespie, & Henderson, 2010). Hodges et al. (2005) proposed that an educational focus on coping with real-world workplace adversities could assist nurses in developing their own innate resilience and maximize their personal recovery from errors.

Nurses' personal recoveries following the error. Patient safety proponents identified the prevention of future errors as essential to improving patient safety on an organizational scale; however, my study demonstrated that learning from an error was not an organizational experience but rather a personal and individualized process. Authors have demonstrated that the impact of an error on nurses can lead to reactions similar to those found in post-traumatic stress (Edrees, Paine, Feroli, & Wu, 2011; Gazoni, Amato, Malik, & Durieux, 2012; Rassin, Kanti, & Silner, 2005).

A systematic review by Sirriyeh, Lawton, Gardner, and Armitage, (2010) revealed that the majority of research studies have explored the attitudes and immediate responses to errors but have not explored the management, coping, or longer-term outcomes of the error experience. The stories told by nurses in my study were often of errors that happened many years, sometimes decades, previous, and each story was remarkable for the lack of follow-up or assistance the nurses had with recovery. Nurses were left to rely on reflection as a means of developing insights toward and understanding of their experiences. In my study, reflection on the errors was demonstrated by the nurses' discussions of long-term impacts of the errors and the ways the experience changed their practices. My study demonstrated findings related to the impact of the error that persisted past the immediate experience.

Other studies described how constructive use of an error aided in personal resolution after the error (Chard, 2010; Karga, Kiekkas, Aretha, & Lemonidou, 2011; Scott et al., 2009; Wu, Folkman, McPhee & Lo, 1993). Harrison et al. (2013) discussed an active recovery process in which nurses sought to learn from and to make changes to their practice after an error. Karga et al. (2011) described how nurses might become

crucial to identifying error-prevention strategies. The act of finding 'good' from a 'bad' situation related to the concepts of resilience. Resilient persons were able to see potential benefits of a situation (Jackson, et al., 2007) and understood the positive aspects of the situation even in the midst of the hardship (Fredrickson, 2004; Tugade & Fredrickson, 2004).

The literature contained studies that included findings regarding nurses feeling responsible to tell patients about the error. This finding was not reflected in my results; none of the nurses' stories contained elements when the nurse either desired or proceeded to tell the patient about the error. Within the literature, some have noted that not disclosing an error to the patient increased nurses' feelings of distress and hindered their ability to reconcile the event within themselves (Crigger & Meek, 2007; Rassin et al., 2005). Other studies described that uncertainty of the nurse's role in disclosure inhibited them from revealing the error to the patient (Shannon, Foglia, Hardy & Gallagher, 2009; Jeffs et al., 2010).

When the nurses committed an error but were reported on by someone else, the organizational response in this small number of stories was a qualitatively different process which remained punitive and lacked a focus on preventing future errors. For example, a nurse was unaware of the error until being "called into the office" by a nursing leader to discuss the error. Other nurses described how they were placed on probation, had fingers pointed at them, and were told they were singularly responsible for the error. The nurses felt like they had been 'caught,' expressed significant embarrassment about these error reports, and voiced concern about the error reports

going on their records. These anxieties were a common theme in the literature (Evans et al., 2006; Taylor et al., 2004; Uribe et al., 2002).

The persistence of these barriers and their influence on reporting indicates the difficulty faced when attempting to change culture. Gorini, Miglioretti and Pravettoni (2012) attempted to identify empirically a 'culture of blame' within healthcare by surveying physicians and nurses regarding their fears of being blamed or being punished in the context of having made an error. These authors discovered that all participants equally demonstrated fear of being blamed for an error and theorized that the fear of being blamed was related to the culture of the workplace, which ultimately results in a lack of error reporting. Their findings echoed those of Waring (2005) who stated that the fear of being blamed is a deep-seated cultural attribute of medicine despite the acknowledged complexity of healthcare work. The implications of this finding are that the culture surrounding error reporting is very difficult to change and overall little progress has been realized in measuring current error rates.

Summary of Implications of the Study

The finding that nurses learned a lesson form an error added to the literature about nurses' reactions to errors and prompts the question of what role nurses should play in error follow-up. A nurse's current role is limited to reporting only, although some organizations are striving to change this. My study's findings demonstrate that those nurses who are involved in the actual errors should be an essential element of the follow-up investigation of an error event so that detailed aspects of how the error occurred can be understood.

Since the beginning of patient safety research, nurses were identified as the 'sharp end' (Kohn et al., 2000) or the 'front line' (Page, 2004) of healthcare processes and patient care activities. The literature acknowledged that nursing personnel frequently noticed and/or intercepted errors (Page, 2004). The errors often resulted from complex systems' interactions (Berwick, 2003). However, reporting systems, including the one described to me by nurses in my study, forced error reporting into a format of pre-identified, singular choice categories and allowed little room for rich, detailed explanations of what occurred surrounding the error event. The complexity of an error was difficult to convey fully in a character-limited text box within an online form, and details and nuances of the error event were lost. Involving nurses in the follow-up investigation of an error and allowing them to tell their stories with encompassing details, persons who wished to understand the error would capture those details and would receive a complete picture of the events prior to, during, and after the error.

Involving the nurse in the investigational follow up after an error will require a shift in language and focus for both those reporting the error and those receiving the error reports. Literature demonstrated that nurses continued to expect punitive responses to an error (Attree, 2007; Crigger & Meek, 2007). In order to change this perception successfully, nursing leadership will have to convey the importance of nurses' involvement in the error investigation as a means of achieving organizational learning. Nursing leaders should focus on the learning goal; the intent of an error investigation should be to examine the situation as events happened from a first-hand account and to identify the system issues faced in order to address those issues on an organization level.

Organizations should evaluate their current systems and should aim to improve on current or incorporate newer processes for error data gathering and dissemination in order to address system issues associated with errors. Undertaking a self-evaluation of an organization's current error reporting culture and system is a beneficial way to establish a baseline and identify potential changes a system requires (Bagian et al., 2001). An organization's self-evaluation should include not only a count of the number of errors reported or a description of the categories of errors, but also a description of follow-up actions, if any, taken after the error was reported. Reporting the error should not be the last step in an error event but instead be the first step in a follow-up loop that encompasses everyone involved with the error experience (Benn et al., 2009; Cochrane et al., 2009).

Improving data gathering would begin with involving the nurse in the follow-up investigation in order to collect the details of the error that may not have been present in the written report. Changing current practices to embrace this step may include the need to change how managers or nursing leadership respond to error reports; adjustments may be necessary in the time allotted to allow for this new follow-up practice. Nursing leadership should make every effort to involve nurses who report errors in follow-up actions or changes made because of the error report. Giving nurses a voice in the error response will make the nurse feel more engaged in the efforts to improve a unit's and/or organization's safety culture (Cochrane et al., 2009). Nurses can also serve as examples to their colleagues and encourage others to voice their concerns and ideas for improvement. All of these activities would improve the act of 'closing the safety feedback loop' as described by Benn et al. (2009).

The current state of error reporting cannot be sustained without a close examination of alternate interventions to create safety supportive cultures. The United States military has used debriefing practices for decades in order to improve performance and learning. After-action reports are designed to allow participants to reflect on and construct meaning from significant experiences and to uncover lessons in those experiences (Tannenbaum & Cerasoli, 2103). Military after-action reports summarize lessons learned or recommendations made to improve outcomes and provide feedback on the accomplishment of various operations (Ross et al., 2008). Military settings have developed their own tools, and recommendations exist to move these tools into use in civilian medical facilities (Tami et al., 2013). Tami et al. (2013) attempted to develop an after-action reporting system for use in emergency rooms after mass casualty incidents (MCIs). These researchers developed their own tool because a validated, accepted after-action tool for use in healthcare settings does not exist.

The chances are unlikely that errors can be eliminated even with advancements in error reporting, improvement in feedback, and an increase in nursing involvement in follow-up. Errors will occur despite best efforts, and nurses will continue to feel responsible and to be traumatized by perceptions of patient harm caused by the error. As demonstrated by the stories told by nurses in my study, the memories of error experiences stay with nurses over time and affect the way they care for future patients. One potential means of assisting nurses to work through their feelings after an error would be for organizations to make accessible supportive resources to a nurse after an error. Organizations could identify programs already in place and discover a means to convey the availability of these programs to nurses without pointing fingers or identifying

individuals. Conversely, if no such support programs exist, efforts could be made toward development and implementation of programs that could assist the nurse during their resolution of the error.

Limitations of the Study

Study sampling. A limitation of the study sampling was that no elements of patient injury and/or death were contained in the stories shared by nurses. A possible explanation was that nurses who experienced patient injury/death were reluctant to step forward and participate by sharing their story. The findings from an experience of patient injury/death would likely be different based on two issues. First, when significant patient injury occurs there is a complex follow-up process that involves nursing, medicine, and hospital administration and lawyers; second, because of the increased scrutiny the nurse may likely experience a resolution process very different from the one identified in this theoretical model. Sampling for this study was focused on allowing any intensive care nurse who was willing to participate tell a story of their choosing; therefore, no purposeful sampling was aimed at discovering stories that involved patient injury and/or death. Therefore, this model would not be expected to apply to a nurse's error experience that resulted in a harmful outcome for the patient.

Another limitation of the sampling was that nurses who volunteered their stories were all female and Caucasian, with the exception of one female who was African-American. The sampling choice was made to allow any intensive care nurse who was agreeable to participate in the study in order to maximize recruitment; no purposeful sampling was made to recruit minorities in nursing, in this case men and non-Caucasian ethnicities. The processes of this theoretical model may differ for male nurses and/or

nurses of other ethnic backgrounds. The results could be altered by the differences between the way men and women internally process and externally interact with others following the error. The processes of the proposed model could be altered if men define errors differently from women, if their attempts at resolution are different, or if they respond differently to the error over the long-term. The proposed model also could be altered because diverse ethnicities may hold different definitions of what constitutes an error and have unique means of resolution based on cultural practices. Consequently this model has limited application to only female, Caucasian nurses who work in an adult intensive care unit.

A third limitation of the sampling was that the nurses interviewed for this study all worked in a large, healthcare organization made up of multiple facilities within a metropolitan Midwestern city. This sampling choice was made to maximize the ability to achieve the desired number of interviews by gaining access to multiple intensive care units. Because the hospitals within this healthcare organization are considered referral centers for many complex patient health needs, the nurses in these units are accustomed to caring for a considerable number of extremely critical patients. The proposed processes in this model may differ for nurses who work in smaller or less busy adult critical care units. The proposed model also could be altered if the ICU is located in more rural settings as these units may have different cultural norms about errors and error reporting. Consequently this model has limited application to only large, referral center intensive care units.

Research design. A limitation to the study's design was the time during which I spent in the units; I limited my visits to day shift hours and only during the weekdays and

thereby did not interact with weekend or nightshift personnel. Weekend and nightshift staffs often have less oversight from nursing administration, medicine, and other ancillary personnel, which may increase the likelihood of nurses not reporting errors by simple virtue of fewer people to notice or to be told about the error. There may be a less prevalent expectation of reporting and there may be less interaction with physicians with regard to protecting the patient except in dire circumstances. Thus, this model is limited in its applicability to only day shift hours during a weekday.

This study was designed to focus on nurses who worked in adult intensive care units in order to increase the chances of interacting with nurses who had experienced an error. The processes of the theoretical model may differ outside the intensive care environment. For example, nurses on a floor unit may have different ideas of what constitutes an error, have more demands placed on them due to a higher patient-to-nurse ratio, and undertake unique actions to decipher and resolve errors based on the perceived threat or lack of threat to a less critically-ill patient. As a result, this model could only be applied to an adult intensive care unit setting.

Opportunities for Future Research

Further research is needed to advance the findings of this study. Problem solving actions and decisions by nurses in response to an error demonstrated a previously unexplored stage in nursing error management. A future study should seek to investigate the possibility of linking or translating the concepts of clinical judgment into these processes use for recognizing and responding to errors as discovered in my study. A future study should also explore the constructs of resilience theory as a framework to study the impact of the error experience on the nurse over the long term. This study

demonstrates a need for research related to the effectiveness of current healthcare organizational approaches to error management. Organizational processes to gather nurses' error stories and to use those stories to promote learning should be developed. A future study should examine the effects of implementing an after-action report as part of a safety-feedback-loop program in order to determine if this program increases nursing's involvement in post-reporting activities. Error reporting systems currently produce definitive outcomes in terms of numbers and types of errors but this information is not adequately shared on a system-wide scale. A future study should explore effective methods of disseminating error information on a system-wide basis to assist organizations with achieving collective contextual learning. Another future study should seek to analyze the data from nurses who observed or reported others' errors and to compare those findings with this model.

The current study did not contain stories of nurses' error experiences that resulted in patient harm/death; therefore, a future study should focus on recruitment of nurses with this type of experience. A future study could determine the similarities and differences between the theoretical model developed in this study and any distinctions that may occur with an error that results in devastating patient outcomes. Since the current study was completed in an intensive care unit and resulted in a sample of day shift nurses representing little diversity, future studies should focus on determining if nurses who work night and/or weekend shifts have different perceptions about errors. Future studies should seek to increase representation of more diversity with respect to gender, ethnicity, and cultural backgrounds to determine if those factors impact nurses' perceptions of errors. Finally, the model proposed here should be studied in both less-populated or rural

intensive care units and non-intensive care units to determine the differences to the processes proposed by my model.

Conclusion

This qualitative study was successful in utilization of grounded theory methodology to ascertain nurses' decision-making processes following their awareness of having made a medical error, as well as how and/or if they corrected and reported the error. Significant literature documents the existence of medical errors; however, this unique study interviewed thirty nurses from adult intensive care units seeking to discover through a detailed interview process their individual stories and experiences, which were then analyzed for common themes. Common themes led to the development of a theoretical model of thought processes regarding error reporting when nurses made an error. Within this theoretical model are multiple processes that outline a shared, time-orientated sequence of events nurses encounter before, during, and after an error. One common theme was the error occurred during a busy day when they had been doing something unfamiliar. Each nurse expressed personal anguish at the realization she had made an error, she sought to understand why the error happened and what corrective action was needed. Whether the error was reported on or told about depended on each unit's expectation and what needed to be done to protect the patient. If there were no perceived patient harm, errors were not reported. Even for reported errors, no one followed-up with the nurses in this study. Nurses were left on their own to reflect on what had happened and to consider what could be done to prevent error recurrence. The overall impact of the process of and the recovery from the error led to learning from the error that persisted throughout her nursing career. Findings from this study illuminate the

unique viewpoint of licensed nurses' experiences with errors and have the potential to influence how the prevention of, notification about and resolution of errors are dealt with in the clinical setting. Further research is needed to answer multiple questions that will contribute to nursing knowledge about error reporting activities and the means to continue to improve error reporting rates.

Appendix A

IOM Quality of Health Care in American Committee

Recommendations to Improve Patient Safety

Over-reaching Goal	Recommendation #1	Recommendation #2
Establish a national focus to create leadership, research, tools, and protocols to enhance the knowledge base about safety	Congress should create a Center for Patient Safety within the Agency for Healthcare Research and Quality	
Identify and learn from errors through immediate and strong mandatory reporting efforts, as well as the encouragement of voluntary efforts, both with the aim of making sure the system continues to be made safer for patients	A nationwide mandatory reporting system should be established that provides for the collection of standardized information by state governments about adverse events that result in death or serious harm. Reporting should initially be required of hospitals and eventually be required of other institutional and ambulatory care delivery settings.	The development of voluntary reporting efforts should be encouraged.
Raise standards and expectations for improvements in safety through the actions of oversight organizations, group purchasers, and professional groups	Congress should pass legislation to extend peer review protections to data related to patient safety and quality improvement that are collected and analyzed by health care organizations for internal use or shared with others solely for purposes of improving safety and quality.	
Create safety systems inside health care organizations through the implementation of safe practices at the delivery level.	Performance standards and expectations for health care organizations should focus greater attention on patient safety	The Food and Drug Administration (FDA) should increase attention to the safe use of drugs in both pre- and post-marketing processes

(Kohn, et al., 2000, pp. 6-13)

Appendix B

IRB Approval

INDIANA UNIVERSITY

OFFICE OF RESEARCH ADMINISTRATION

To: PATRICIA R. EBRIGHT
NURSING

From: IU Human Subjects Office
Office of Research Administration – Indiana University

Date: August 02, 2013

RE:

Protocol Title: To Report or Not Report: A Qualitative Study of Nurses' Decisions in Error Reporting

Protocol #: 1209009478

Funding Agency/Sponsor: None

IRB: IRB-04, IRB00000219

Expiration Date: July 31, 2015

The above-referenced protocol was reviewed by the Institutional Review Board (IRB-04). The protocol is approved as Active - Open to Enrollment for a period of August 01, 2013 through July 31, 2015. This approval does not replace any departmental or other approvals that may be required.

If you submitted and/or are required to provide participants with an informed consent document, study information sheet, or other documentation, a copy of the enclosed approved stamped document(s) is enclosed and must be used.

Please note that as the principal investigator (or faculty sponsor in the case of a student protocol) of this study, you assume the following responsibilities:

1. **CONTINUING REVIEW:** You must receive re-approval of ongoing research prior to the protocol's expiration date (noted above). You may receive a renewal reminder from our office approximately two months prior to the expiration date; however, it is your responsibility to submit the applicable protocol documentation to the IRB in a timely manner. If continued approval is not received by the expiration date, the study will automatically expire, requiring all research activities, including enrollment of new subjects, interaction and intervention with current participants, and analysis of identified data to cease.

2. **AMENDMENTS:** You must request approval from the IRB of any proposed changes to the research prior to implementation. An amendment form can be obtained at: http://researchadmin.iu.edu/HumanSubjects/hs_forms.html.

3. **UNANTICIPATED PROBLEMS AND NONCOMPLIANCE:** You must report unanticipated problems and noncompliance to the IRB according to the Unanticipated Problems and Noncompliance SOP, which can be found at: http://researchadmin.iu.edu/HumanSubjects/hs_policies.html.

4. **COMPLETION:** You must promptly notify the IRB when the research is complete. To notify the IRB of study closure, please obtain a close-out form at: http://researchadmin.iu.edu/HumanSubjects/hs_forms.html.

5. **LEAVING THE INSTITUTION:** You must notify the IRB of the disposition of the research when you leave the institution.

Note: SOPs exist covering a variety of topics that may be relevant to the conduct of your research. For more information on the relevant policies and procedures, go to http://researchadmin.iu.edu/HumanSubjects/hs_policies.html.

You should retain a copy of this letter and any associated approved study documents (e.g. informed consent or information sheet) for your records. Please refer to the project title and number in future correspondence with our office. Additional information is available on our website at http://researchadmin.iu.edu/HumanSubjects/index.html. Please contact our office if you have questions or need further assistance.

Thank you.

Appendix C

Email to CNOs

Mr/Ms. Last name,

Please allow me to introduce myself. My name is Amy Koehn, and I am a doctoral candidate at the Indiana University School of Nursing. I am working on my dissertation and would like to ask for your assistance.

My dissertation topic is error reporting, particularly why nurses chose to either report or not report an error. I hope to gain a better understanding of and be able to model a decision-making process regarding error reporting when nurses believe they have made, witnessed, or have knowledge of an error. I anticipate the findings will be used to help guide future studies to increase reporting rates and improve patient safety.

My study method is qualitative, grounded theory which will consist of interviewing those bedside nurses who agree to participate. I wish to focus on nurses in critical care areas, since literature has shown that errors are more frequent and often more severe in critical care areas. I would like to negotiate with you and the appropriate nursing management of the unit(s) a means by which I could perform my study at your institution.

My study protocol includes an initial period of time spent getting to know the staff. I would attend a staff meeting for the particular unit to introduce myself and the study, and I will also have a flyer to display in a common area. Prior to any data collection, I would first spend some time, two to three days, observing and getting to know the staff during their daily routine. I believe that spending time with the staff as a researcher and an observer will help establish a relationship with them and aid in recruiting nurses to discuss a potentially sensitive topic. Once a nurse agrees to be

interviewed, we will do this outside of normal working hours in a neutral environment away from their home unit. They will be given the opportunity to sign an informed consent, and the interview itself will be digitally recorded and transcribed by an Indiana University-approved outside service. Only I and my dissertation committee will have access to the transcribed interviews. At the completion I am offering participants a $25.00 gift card in compensation for their time.

If you are agreeable to exploring this opportunity further, I would ask that you direct me toward the appropriate critical care units within your organization and advise me of the manager's names and email addresses so that I can contact him or her directly. You may forward this email also as further explanation as needed. Should you or they have any questions, you may contact me at this email address (arkoehn@iupui.edu) or contact my dissertation chairperson, Dr. Pat Ebright at prebrigh@iupui.edu. Thank you for your time and consideration.

Sincerely,

Amy R Koehn,
PhD Candidate, IU SON

Appendix D

Flyer

Do you have a story to share?
This is your chance!!
Share your story and
Participate in a research study!

WHO:
All critical care nurses (RNs, LPNs, or LVNs) whose primary role is patient care.

WHAT:
A qualitative study to explore a nurse's decision-making process regarding error reporting when they believe they have made, witnessed, or have knowledge of an error.

WHERE:
If you're willing, you will be asked to consent to an interview about this topic. The interview will take place away from normal working hours at a neutral location within the hospital, and it will last no longer than 1 hour.

WHEN:
Date to Date as appropriate based on timeframe study will occur in a particular institution

WHY:
We all know that errors are common in healthcare; my interest as a researcher is to study the process surrounding the decision to report or not report the error. By understanding how nurses think about this, we can use the information to guide further studies, increase error reporting rates, and hopefully make care safer for all patients. Also, you will receive a $25.00 gift card for participating.

HOW:
The study is being conducted by Amy Koehn, a nurse practitioner and PhD candidate at IU. She will be observing in the unit for a few days in order to get to know everyone and how the unit routine works on a daily basis, so during this time she'll be available for questions and comments. If you wish to participate and do not encounter her, please contact her by phone at 317-965-8924 to discuss participation.

**Printed on green paper with green font and straight line boarder edge surrounding.

Appendix E

IRB Informed Consent

IRB STUDY #1209009478

INDIANA UNIVERSITY INFORMED CONSENT STATEMENT FOR

To Report or Not Report: A Qualitative Study of Nurses' Decisions in Error Reporting

You are invited to participate in a research study of nurses' thinking about error reporting. You were selected as a possible subject because you are a licensed nurse who provides direct patient care in an adult intensive care unit. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

The study is being conducted by Amy Koehn, the co-investigator and a doctoral student in the IU School of Nursing and her advisor and the primary investigator, Dr. Pat Ebright.

STUDY PURPOSE

The purpose of this study is to ask nurses about how they decide to report or not report an error. Studies have shown that increased error reporting rates are linked to higher levels of patient safety. By asking nurses about how they make the decision to report an error, we hope to better understand what influences the decision to report. By understanding how nurses think about this, we can better design systems to support nurses in reporting errors.

NUMBER OF PEOPLE TAKING PART IN THE STUDY:

If you agree to participate, you will be one of 30 nurses who will be participating in this research.

PROCEDURES FOR THE STUDY:

If you agree to be in the study, you will do the following things:

You will be interviewed by Ms. Koehn about a medical error you have experienced. The interview will be recorded for analysis. The interview will last no more than one hour and will be held outside of your normal work hours in a neutral location within your hospital.

RISKS OF TAKING PART IN THE STUDY:

While on the study, the risks are:

It may be stressful to recall an event that upset you. Some of the interviews questions may make you feel uncomfortable. You may choose to answer them or not.

Questions will be asked in a conversational manner, and you will be given ample time to think about and respond with your answers. You are free to leave the room at any time the interview becomes uncomfortable, either just for a break or to stop the interview.

All data from the interview will have an anonymous ID number on it, not your name, except for the informed consent. The informed consent with your name on it will be kept in a locked cabinet that only Ms. Koehn can access in a location that is away from the study sites. Any notes that Ms. Koehn takes during the interview will also be identified only by the anonymous ID number. The recordings of the interview will be saved to an encrypted, password protected hard drive and then deleted from the recording device's memory. The digital recordings will be sent over an encrypted website to a transcription service that deals with multiple studies at IU and adheres to strict confidentiality rules. The transcription that is returned from them will have only the anonymous ID number on it, and the transcript will be reviewed for any information that could potentially identify you. That information will be removed from the transcript by Ms. Koehn.

There is a small, possible risk of loss of confidentiality with recorded data. If details of our discussion were inadvertently discovered, there is a slight risk your employer could take action. However, every precaution has been taken to ensure that the information you share for this study will remain confidential. No feedback regarding your individual data or performance will be reported to respective supervisors at work. Results of the study will be reported as group data, and only de-identified combinations of situations will be used to illustrate error reporting practices.

Once the study is complete, the digital recordings will be erased and the handwritten notes destroyed. The informed consents will be kept for 7 years, which is a standard research protocol, and continued to be locked in a secure cabinet accessible only by Ms. Koehn.

BENEFITS OF TAKING PART IN THE STUDY:

You are not expected to benefit directly by participating in this research.

ALTERNATIVES TO TAKING PART IN THE STUDY:

Instead of being in the study, you can choose not to participate.

CONFIDENTIALITY

Efforts will be made to keep your personal information confidential. We cannot guarantee absolute confidentiality. Your personal information may be disclosed if required by law. Your identity will be held in confidence in reports in which the study may be published and in databases in which results may be stored. Nothing discussed in the interview will be shared with your employer and no actions will result of any issues discussed during the interview.

Organizations that may inspect and/or copy research records for quality assurance and data analysis include groups such as the study investigator and his/her research associates, the Indiana University Institutional Review Board or its designees, and (as allowed by law) state or federal agencies, specifically the Office for Human Research Protections (OHRP), who may need access to your research records.

PAYMENT

You will receive compensation for taking part in this study. A $25.00 gift card to a major discount store will be given to each participant at the completion of the interview.

CONTACTS FOR QUESTIONS OR PROBLEMS

For questions about the study, contact the co-investigator Amy Koehn at 317-965-8924 or the principal investigator Dr. Pat Ebright at 317-274-3115. If you cannot reach the researcher during regular business hours (i.e. 8:00AM-5:00PM), please call the IU Human Subjects Office at (317) 278-3458 or (800) 696-2949.

For questions about your rights as a research participant or to discuss problems, complaints or concerns about a research study, or to obtain information, or offer input, contact the IU Human Subjects Office at (317) 278-3458 or (800) 696-2949.

VOLUNTARY NATURE OF STUDY

Taking part in this study is voluntary. You may choose not to take part or may leave the study at any time. Leaving the study will not result in any penalty or loss of benefits to which you are entitled. Your decision whether or not to participate in this study will not affect your current or future relations with Indiana University or IU Health.

SUBJECT'S CONSENT

In consideration of all of the above, I give my consent to participate in this research study.

I will be given a copy of this informed consent document to keep for my records. I agree to take part in this study.
Subject's Printed Name:_____

Subject's Signature:Date: _____
(must be dated by the subject)

Printed Name of Person Obtaining Consent:_____

Signature of Person Obtaining Consent:_____Date:_____

Appendix F

Interview Questions

Preface (to be read to each participant after they have signed the informed consent and immediately prior to beginning the interview):

We all know that errors are common in healthcare and likely just about everyone has made an error at one point or another in their career. My interest as a researcher is what you thought about following the error with regard to reporting it, so the purpose of this interview is to talk about that. I am going to ask you questions about your experience with errors, so I'd like you to think about any particular error that has stuck with you. We can discuss any event you'd like to; it does not have to be only an error you reported. Whatever we talk about here will be seen only by me and my dissertation committee members; it will not be shared with anyone from (*appropriate location*).

1. When I say the word 'error' what does that mean to you?
2. Can you tell me about a personal experience with an error you've been involved in?
3. Could you describe the happenings that led up to and surrounded this particular event?
4. What did you first experience or notice with this error?
5. Tell me about your thoughts and feelings when you realized this event had occurred.
6. As you look back on the event, are there any other experiences around this event that stand out in your mind? If so, could you describe it or them?
7. How does an event like this differ from an experience of seeing someone else make an error?
8. Did you tell anyone about the event? Why or why not? In what manner?
9. Is there anything else you think I should know in order to understand the event better?

Appendix G

Demographics of Nurses

Participant number	Gender	Ethnicity	Age	Yrs. as RN	Yrs. in current
-101	F	Caucasian	29	7	3
-102	F	Caucasian	23	3	1
-103	F	Caucasian	61	40	7
-104	F	Caucasian	55	27.5	2
-105	F	Caucasian	57	37	19
-106	F	African- American	36	6	1
-107	F	Caucasian	33	5	2
-108	F	Caucasian	33	7	2
-109	F	Caucasian	27	3	3
-110	F	Caucasian	36	1.5	0.75
-111	F	Caucasian	30	5	5
-112	F	Caucasian	24	1.5	1.5
-113	F	Caucasian	25	2	2
-114	F	Caucasian	43	10	9
-115	F	Caucasian	22	2.5	1.5
-116	F	Caucasian	63	23	5
-117	F	Caucasian	31	9	7
-118	F	Caucasian	24	2	1
-119	F	Caucasian	25	3	1
-120	F	Caucasian	55	29	17
-121	F	Caucasian	28	5	5
-122	F	Caucasian	33	4	0.75
-123	F	Caucasian	38	14	10
-124	F	Caucasian	33	9	9
-125	F	Caucasian	25	2	2
-126	F	Caucasian	42	19	5
-127	F	Caucasian	24	1.5	1.5
-128	F	Caucasian	24	1.5	1.5
-129	F	Caucasian	26	4	2
-130	F	Caucasian	25	3	3
MEAN			**34**	**9.57**	**4.35**
MIN			22	1.50	0.75
MAX			63	40.00	19.00

References

Aftermath. (n.d.). In Merriam-Wesbter's online dictionary (11th ed.). Retrieved from http://www.merriam-webster.com/dictionary/aftermath

Ahern, K., & McDonald, S. (2002). The beliefs of nurses who were involved in a whistleblowing event. *Journal of Advanced Nursing, 38*, 303-309. doi:10.1046/j.1365-2648.2002.02180.x

AHRQ: Agency for Healthcare Research and Quality. (2003). *AHRQ's patient safety initiative: Appendix 1. Patient safety terms and definitions.* Retrieved from http://www.ahrq.gov/qual/pscongrpt/psiniapp1.htm

AHRQ: Agency for Healthcare Research and Quality. (2004). *Hospital survey on patient safety culture.* Retrieved from http://www.ahrq.gov/qual/patientsafetyculture/hospsurvindex.htm

AHRQ: Agency for Healthcare Research and Quality. (2008). *The patient safety and quality improvement act of 2005: Overview.* Retrieved from http://www.ahrq.gov/qual/psoact.htm

AHRQ: Agency for Healthcare Research and Quality (2010). *National healthcare quality report.* Retrieved from http://www.ahrq.gov/qual/qrdr11.htm

Anderson, D. J., & Webster, C. S. (2001). A systems approach to the reduction of medication error on the hospital ward. *Journal of Advanced Nursing, 35*(1), 34-41. doi:10.1046/j.1365-2648.2001.01820.x

Andrews, L. B., Stocking, C., Krizek, T., Gottlieb, L., Krizek, C., Vargish, T., & Siegler, M. (1997). An alternative strategy for studying adverse events in medical care. *Lancet, 349*(9048), 309-313. doi:10.1016/S0140-6736(96)08268-2

Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin, 84*, 888-918. doi:10.1037/0033-2909.84.5.888

Alfredsdottir, H., & Bjornsdottir, K. (2008). Nursing and patient safety in the operating room. *Journal of Advanced Nursing, 61*, 29-37. doi:10.1111/j.1365-2648.2007.04462.x

Anonymous. (1966). Summary of the national halothane study. Possible association between halothane anesthesia and postoperative hepatic necrosis. *JAMA, 197*, 775-788. doi:10.1001/jama.1966.03110100083020

Ashcroft, D. M., Morecroft, C., Parker, D., Noyce, P. R., Ashcroft, D. M., Morecroft, C., … Noyce, P. R. (2006). Likelihood of reporting adverse events in community pharmacy: An experimental study. *Quality & Safety in Health Care, 15*, 48-52. doi:10.1136/qshc.2005.014639

Attree, M. (2007). Factors influencing nurses' decisions to raise concerns about care quality. *Journal of Nursing Management, 15*, 392-402. doi:10.1111/j.1365-2834.2007.00679.x

Bagian, J. P., Lee, C., Gosbee, J., DeRosier, J., Stalhandske, E., Eldridge, N., … Burkhardt, M. (2001). Developing and deploying a patient safety program in a large health care delivery system: You can't fix what you don't know about. *Joint Commission Journal on Quality Improvement, 27(10)*, 522-532. Retrieved from http://www.jcrinc.com/

Baker, H. M. (1997). Rules outside the rules for administration of medication: A study in New South Wales, Australia. *Image - the Journal of Nursing Scholarship, 29*, 155-158. doi:10.1111/j.1547-5069.1997.tb01549.x

Barker, K., & McConnell, W. (1962). The problems of detecting medication errrors in hospitals. *American Journal of Hospital Pharmacy, 19*, 360-369. Retrieved from http://psnet.ahrq.gov/resource.aspx?resourceID=1071

Balas, M. C., Scott, L. D., & Rogers, A. E. (2006). Frequency and type of errors and near errors reported by critical care nurses. *Canadian Journal of Nursing Research, 38*(2), 24-41. Retrieved from http://www.mcgill.ca/cjnr/

Bartels, J. E., & Bednash, G. (2005, January-March). Answering the call for quality nursing care and patient safety: A new model for nursing education. *Nursing Administration Quarterly, 29*(1), *5-13.* Retrieved from http://journals.lww.com/naqjournal/Pages/default.aspx

Bartlett, R. (1996). *Bartlett's Roget's Thesaurus.* Boston, MA: Little, Brown and Company.

Bates, D. W., Cullen, D. J., Laird, N., Petersen, L. A., Small, S. D., Servi, D., … Hallisey, R. (1995). Incidence of adverse drug events and potential adverse drug events. Implications for prevention. ADE Prevention Study Group *JAMA, 274*(1), 29-34. doi:10.1001/jama.274.1.29

Beckmann, U., Bohringer, C., Carless, R., Gillies, D. M., Runciman, W. B., Wu, A. W., & Pronovost, P. (2003). Evaluation of two methods for quality improvement in intensive care: Facilitated incident monitoring and retrospective medical chart review. *Critical Care Medicine, 31*, 1006-1011. doi:10.1097/01.CCM.0000060016.21525.3C

Beecher, H. K., & Todd, D. P. (1954). A study of deaths associated with anesthesia and surgery. *Annuals of Surgery, 140*(1), 2-34. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1609600/pdf/annsurg01316-0011.pdf

Benner, P., Sheets, V., Uris, P., Malloch, K., Schwed, K., & Jamison, D. (2002). Individual, practice, and system causes of errors in nursing: A taxonomy. *Journal of Nursing Administration, 32*, 509-523. doi:10.1097/00005110-200210000-00006

Benn, J., Koutantji, M., Wallace, L., Spurgeon, P., Rejman, M., Healey, A., & Vincent, C. (2009). Feedback from incident reporting: Information and action to improve patient safety. Quality and Safety in Healthcare, 18, 11-21. doi:10.1136/qshc.2007.024166

Berwick, D. M. (2003). Errors today and errors tomorrow. *New England Journal of Medicine, 348*, 2570-2572. doi:10.1056/NEJMe030044

Bianchi-Sand, S. (2003). It takes a team to prevent errors. *The American Journal of Nursing, 103*(12), 89-90. doi:10.1097/00000446-200312000-00027

Billings, D. & Halstead, J. (2005). Teaching in Nursing: A Guide for Faculty 2nd Edition. St. Louis, MO: Elsevier Saunders.

Boyle, D., O'Connell, D., Platt, F. W., & Albert, R. K. (2006). Disclosing errors and adverse events in the intensive care unit. [Review]. *Critical Care Medicine, 34*, 1532-1537. doi:10.1097.01.CCM.0000215109.91452.A3

Brennan, T. A., Leape, L. L., Laird, N. M., Hebert, L., Localio, A. R., Lawthers, A. G., … Hiatt, H. H. (1991). Incidence of adverse events and negligence in hospitalized patients: Results of the Harvard medical practice study. *New England Journal of Medicine, 324*, 370-376. doi:10.1056/NEJM199102073240604

Cassirer, C., & Anderson, D. (2004). The future of patient safety: Reflections on history, the data, and what it will take to succeed. In B. J. Youngberg, & M. J. Hatlie (Eds.), *The Patient Safety Handbook* (pp. 753-764). Sudbury, MA: Jones and Bartlett Publishers.

Catchpole, K., Mishra, A., Handa, A., & McCulloch, P. (2008). Teamwork and error in the operating room: Analysis of skills and roles. *Annals of Surgery, 247*, 699-706. doi:10.1097/SLA.0b013e3181642ec8

Chard, R. (2010). How perioperative nurses define, attribute causes of, and react to intraoperative nursing errors. AORN, 91(1), 132-145. http://dx.doi.org/10.1016/j.aorn.2009.06.028

Charmaz, K. (2006). *Constructing grounded theory: A practicle guide through qualitative analysis*. London: SAGE Publications, Inc.

Christian, C. K., Gustafson, M. L., Roth, E. M., Sheridan, T. B., Gandhi, T. K., Dwyer, K., … Dierks, M. M. (2006). A prospective study of patient safety in the operating room. *Surgery, 139*, 159-173. doi.org/10.1016/j.surg.2005.07.037

Clancy, C. M. (2008). New patient safety organizations lower roadblocks to medical error reporting. *American Journal of Medical Quality 23*, 318-321. doi:10.1177/1062860608319673

Clancy, T. R., & Delaney, C. W. (2005). Complex nursing systems. *Journal of Nursing Management, 13*, 192-201. doi:10.1111/j.1365-2834.2004.00518.x

Clayman, M. A., Clayman, S. M., Steele, M. H., & Seagle, M. B. (2007). Promoting a culture of patient safety: A review of the Florida moratoria data: What we have learned in 6 years and the need for continued patient education. *Annals of Plastic Surgery, 58*, 288-291. doi:10.1097.01.sap.0000250855.82529.e3

Cochrane, D., Taylor, A., Miller, G., Hait, V., Matsui, I., Bharadwaj, M., & Devine, P. (2009). Establishing a provincial patient safety and learning system: Pilot project results and lessons learned. Healthcare Quarterly, 12, 147-153. doi:10.12927/hcq.2009.20717

Cohen, M. M., Kimmel, N. L., Benage, M. K., Cox, M. J., Sanders, N., Spence, D., & Chen, J. (2005). Medication safety program reduces adverse drug events in a community hospital. *Quality & Safety in Health Care, 14*, 169-174. doi:10.1136.qshc.2004.010942

Cohen, M. M., Kimmel, N. L., Benage, M. K., Hoang, C., Burroughs, T. E., & Roth, C. A. (2004). Implementing a hospitalwide patient safety program for cultural change. *Joint Commission Journal on Quality & Safety, 30*, 424-431. Retrieved from http://www.jcrinc.com/

Cook, A. F., Hoas, H., Guttmannova, K., & Joyner, J. C. (2004). An error by any other name. *American Journal of Nursing, 104*(6), 32-43. doi:10.1097/00000446-200406000-0025

Cooper, M. D. (2000). Towards a model of safety culture. *Safety Science, 36*, 111-136. Retrieved from http://www.behavioral-safety.com/articles/Towards_a_model_of_safety_culture.pdf

Corbin, J., & Strauss, A. (1990). Grounded theory research: Procedures, cannons, and evaluative criteria. *Qualitative Sociology, 13*(1), 3-21. doi:10.1007/BF00988593

Corbin, J., & Strauss, A. (2008). *Basics of qualitative reserach* (3rd ed.). Los Angeles, CA: Sage Publications.

Covell, C. L., & Ritchie, J. A. (2009). Nurses' responses to medication errors: Suggestions for the development of organizational strategies to improve reporting. *Journal of Nursing Care Quality, 24*, 287-297. doi:10.1097/NCQ.0b013e3181a4d506

Crigger, N. J., & Meek, V. L. (2007). Toward a theory of self-reconciliation following mistakes in nursing practice. *Journal of Nursing Scholarship, 39*, 177-183. doi:10.1111/j.1547-5069.2007.00164.x

Cullen, D. J., Sweitzer, B. J., Bates, D. W., Burdick, E., Edmondson, A., & Leape, L. L. (1997). Preventable adverse drug events in hospitalized patients: A comparative study of intensive care and general care units. *Critical Care Medicine, 25*, 1289-1297. doi:10.1097/00003246-199708000-00014

Cuschieri, A. (2006). Nature of human error: Implications for surgical practice. *Annals of Surgery, 244*, 642-648. doi:10.1097/01.sla.0000143601.36582.18

Deutschendorf, A. L. (2003). From past paradigms to future frontiers: Unique care delivery models to facilitate nursing work and quality outcomes. *Journal of Nursing Administration, 33*(1), 52-59. doi:10.1097/00005110-200301000-00010

Dodek, P. M., & Raboud, J. (2003). Explicit approach to rounds in an ICU improves communication and satisfaction of providers. *Intensive Care Medicine, 29,* 1584-1588. doi:10.1007/s00134-003-1815-y

Donchin, Y., Gopher, D., Olin, M., Badihi, Y., Biesky, M., Sprung, C. L., … Cotev, S. (1995). A look into the nature and causes of human errors in the intensive care unit. *Critical Care Medicine, 23*, 294-300. Retrieved from http://journals.lww.com/ccmjournal/pages/issuelist.aspx

Edrees, H., Paine L., Feroli E., & Wu, A. (2011). Health care workers as second victims of medical errors. Polish Archives of Internal Medicine, 121(4), 101–108. Retrieved from http://www.pamw.pl/en/issue/2011-vol-121-no-4

Elder, N., Brungs, S., Nagy, M., Kudel, I., & Render, M. (2008). Nurses' percpetions of error communication and reporting in the intensive care unit. *Journal of Patient Safety, 4*, 162-168. doi:10.1097/PTS.0b013e3181839b48

Espin, S., Levinson, W., Regehr, G., Baker, G. R., & Lingard, L. (2006). Error or "act of God"? A study of patients' and operating room team members' perceptions of error definition, reporting, and disclosure. *Surgery, 139*, 6-14. doi:10.1016/j.surg.2005.07.023

Espin, S., Lingard, L., Baker, G. R., & Regehr, G. (2006). Persistence of unsafe practice in everyday work: An exploration of organizational and psychological factors constraining safety in the operating room. *Quality & Safety in Health Care, 15*, 165-170. doi:10.1136/qshc.2005.017475

Espin, S., Regehr, G., Levison, W., Baker, G. R., Biancucci, C., & Lingard, L. (2007). Factors influencing perioperative nurses' error reporting preferences. *AORN Journal, 85*, 527-543. doi:10.1016/S0001-2092(07)60125-2

Evans, S. M., Berry, J. G., Smith, B. J., Esterman, A., Selim, P., O'Shaughnessy, J., & DeWit, M. (2006). Attitudes and barriers to incident reporting: A collaborative hospital study. *Quality & Safety in Health Care, 15*, 39-43. doi:10.1136/qshc.2004.012559

Farley, D., Haviland, A., Champagne, S., Jain, A., Battles, J., Munier, W., & Loeb, J. (2008). Adverse-event–reporting practices by US hospitals: Results of a national survey. Quality and Safety in Health Care, 17, 416-423. http://dx.doi.org/10.1136/qshc.2007.024638

Farley, D., Haviland, A., Haas, A., Pham, C., Bunier, W., & Battles, J. (2012). How event reporting by US hospitals has changed from 2005 to 2009. BMJ Quality and Safety, 21, 70-77. doi:10-1136/bmjqs-2011-000114

Firth-Cozens, J., Redfern, N., & Moss, F. (2004). Confronting errors in patient care: The experiences of doctors and nurses. *Clinical Risk, 10* (5). 184–190. doi:10.1258/1356262041591195

Flemons, W., & McRae, G. (2012). Reporting, learning, and the culture of safety. Healthcare Quarterly, 15, 12-17. http://dx.doi.org/10.12927/hcq.2012.22847

Fletcher, G., Flin, R., McGeorge, P., Glavin, R., Maran, N., & Patey, R. (2003). Anaesthetists' non-technical skills (ANTS): Evaluation of a behavioural marker system. *British Journal of Anaesthesia, 90*, 580-588. doi:10.1093/bja/aeg112

Fredrickson, B. (2004). The broaden-and-build theory of positive emotions. Philosophical Transactions of the Royal Society London Biological Sciences 359(1449), 1367–1377. doi:10.1098/rstb.2004.1512

Gandhi, T., Graydon-Baker, E., Huber C., Whittemore, A., & Gustafson, M. (2005). Reporting systems: Closing the loop: Follow-up and feedback in a patient safety program. *Joint Commission Journal on Quality and Patient Safety, 31*, 614-621. Retrieved from http://www.jcrinc.com/Periodicals/the-joint-commission-journal-on-quality-and-patient-safety/847/

Gazoni, F. M., Amato, P. E., Malik Z. M., & Durieux, M. E. (2012). The impact of perioperative catastrophes on anesthesiologists: Results of a national survey. Anesthesia & Analgesia, 114, 596–603. http://dx.doi.org/10.1213/ane.0b013e318227524e

Geller, E. S. (2000). Ten leadership qualities for a total safety culture. *Professional Safety, 45*(5), 30-32. Retrieved from http://www.allbusiness.com/labor-employment/workplace-health-safety/11439922-1.html

Ginsburg, L., Norton, P. G., Casebeer, A., & Lewis, S. (2005). An educational intervention to enhance nurse leaders' perceptions of patient safety culture. *Health Services Research, 40*, 997-1020. doi:10.1111/j.1475-6773.2005.00401.x

Giraud, T., Dhainaut, J. F., Vaxelaire, J. F., Joseph, T., Journois, D., Bleichner, G., … Monsallier, J. F. (1993). Iatrogenic complications in adult intensive care units: A prospective two-center study. *Critical Care Medicine, 21*(1), 40-51. doi:10.1097/00003246-199301000-00011

Glaser, B. (1978). *Theoretical Sensitivity: Advances in methodolgy of grounded theory*. Mill Valley, CA: Sociological Press.

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago, IL: Aldine.

Gorini, A., Miglioretti, M., & Pravettoni, G. (2012). A new perspective on blame culture: An experimental study. Journal of Evaluation in Clinical Practice, 18, 671-675. doi:10.1111/j.1365-2753.2012.01831.x

Grafton, E., Gillespie, B., & Henderson, S. (2010). Resilience: The power within. Oncology Nursing Forum, 37, 698-705. doi:10.1188/10.ONF.698-705

Grasso, B. C., Rothschild, J. M., Jordan, C. W., & Jayaram, G. (2005). What is the measure of a safe hospital? Medication errors missed by risk management, clinical staff, and surveyors. *Journal of Psychiatric Practice, 11*, 268-273. doi:10.1097/00131746-200507000-00008

Guerlain, S., Adams, R. B., Turrentine, F. B., Shin, T., Guo, H., Collins, S. R., & Calland, J. F. (2005). Assessing team performance in the operating room: Development and use of a "black-box" recorder and other tools for the intraoperative environment. *Journal of the American College of Surgeons, 200*, 29-37. doi:10.1016/j.jamcollsurg.2004.08.029

Hall, W., & Callery, P. (2001). Enhancing the rigor of grounded theory: Incorporating reflexivity and relationality. *Qualitative Health Research, 11*, 257-272. doi:10.1177/104973201129119082

Hartnell, N., MacKinnon, N., Sketris, I., & Fleming, M. (2012). Identifying, understanding and overcoming barriers to medication error reporting in hospitals: A focus group study. BMJ Quality & Safety, 21, 361-368. http://dx.doi.org/10.1136/bmjqs-2011-000299

Helmreich, R. L. (2000). On error management: Lessons from aviation. *BMJ*, *320*(7237), 781-785. Retrieved from http://homepage.psy.utexas.edu/homepage/group/helmreichlab/publications/pubfiles/pub246.pdf

Helmreich, R. L., & Davies, J. M. (2004). Culture, threat, and error: Lessons from aviation. *Canadian Journal of Anesthesia, 51*(6), R1-R4. Retrieved from http://homepage.psy.utexas.edu/homepage/group/helmreichlab/publications/388.pdf

Helmreich, R. L., Foushee, H. C., Benson, R., & Russini, W. (1986). *Cockpit resource management: Exploring the attitude-performance linkage.* Federal Aviation Administration. Retrieved from http://www.faa.gov/library/online_libraries/aerospace_medicine/sd/media/helmreich_r.pdf

Helmreich, R. L., & Merritt, A. C. (1998). *Culture at work in avaiation and medicine: National, organizational, and professional influences.* Brookfield, VT: Ashgate.

Hicks, R. W., & Becker, S. C. (2006). An overview of intravenous-related medication administration errors as reported to MEDMARX, a national medication error-reporting program. *Journal of Infusion Nursing, 29*(1), 20-27. doi:10.1097/00129804-200601000-00005

Hodges, H. F., Keeley, A. C., & Grier, E. C. (2005). Professional resilience, practice longevity, and Parse's theory for baccalaureate education. Journal of Nursing Education, 44, 538–554. Retrieved from http://www.healio.com/journals/jne

Holden, L. M. (2005). Complex adaptive systems: Concept analysis. *Journal of Advanced Nursing, 52*, 651-657. doi:10.1111/j.1365-2648.2005.03638.x

Hovland, C. I. (1959). Reconciling conflicting results derived from experimental and survey studies of attitude change. *American Psychologist, 14*, 8-17. doi:10.1037/h0042210

Howard, S. K., Gaba, D. M., Fish, K. J., Yang, G., & Sarnquist, F. H. (1992). Anesthesia crisis resource management training: Teaching anesthesiologists to handle critical incidents. *Aviation Space & Environmental Medicine, 63,* 763-770. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/1524531

Hosford, S. B. (2008). Hospital progress in reducing error: The impact of external interventions. *Hospital Topics, 86*(1), 9-19. doi:10.3200/HTPS.86.1.9-20

Ilan, R., Squires, M., Panopoulos, C., & Day, A. (2011). Increasing patient safety event reporting in 2 intensive care units: A prospective interventional study. Journal of Critical Care, 26, 431e.11-431e.18. doi:10.1016/j.jcrc.2010.10.

Jackson, D., Firtko. A., & Edenborough, M. (2007). Personal resilience as a strategy for surviving and thriving in the face of workplace adversity: A literature review. Journal of Advanced Nursing, 60(1), 1-9. doi:10.1111/j.1365-2648.2007.04412.x

Jeffe, D. B., Dunagan, W. C., Garbutt, J., Burroughs, T. E., Gallagher, T. H., Hill, … Fraser, V. J. (2004). Using focus groups to understand physicians' and nurses' perspectives on error reporting in hospitals. *Joint Commission Journal on Quality & Safety, 30*, 471-479. Retrieved from http://www.jcrinc.com/

Jeffs, L., Espin, S., Shannon, E., Levinson, W., Kohn, M., & Lingard, L. (2010). A new way of relating: Perceptions associated with a team-based error disclosure simulation intervention. *Quality and Safety in Healthcare, 19*(3), i57-60. doi:10.1136/qshc.2009.036418

Kahn, K. L., Rogers, W. H., Rubenstein, L. V., Sherwood, M. J., Reinisch, E. J., Keeler, E. B., … Brook, R. H. (1990). Measuring quality of care with explicit process criteria before and after implementation of the DRG-based prospective payment system. *JAMA, 264*, 1969-1973. doi:10.1001/jama.1990.03450150069033

Kalisch, B. J., & Aebersold, M. (2006). Overcoming barriers to patient safety. *Nursing Economics, 24*(3), 143-148. Retrieved from http://www.nursingeconomics.net/cgi-bin/WebObjects/NECJournal.woa

Kane-Gill, S., & Weber, R. J. (2006). Principles and practices of medication safety in the ICU. [Review]. *Critical Care Clinics, 22*, 273-290. doi:10.1016/j.ccc.2006.02.005

Kaplan, H., & Fastman, B. R. (2003). Organization of event reporting data for sense making and system improvement. *Quality and Safety in Health Care, 12*, ii68–72S. doi:10.1136/qhc.12.suppl_2.ii68

Karga, M., Kiekkas, P., Aretha, D., & Lemonidou, C. (2011). Changes in nursing practice: Associations with responses to and coping with errors. *Journal of Clinical Nursing, 20*, 3246-3255. doi:10.1111/j.1365-2702.2011.03772.x

Kerlinger, F. N., & Lee, H. B. (2000). *Foundations of Behavioral Research* (4th ed.). Northridge, CA: Wadsworth.

Kilter. (n.d.). In Merriam-Wesbter's online dictionary (11th ed). Retrieved from http://www.merriam-webster.com/dictionary/off kilter/

Kinney, E. D. (1995). Malpractice reform in the 1990s: Past disappointments, future success? *Journal of Health Politics, Policy & Law, 20*(1), 99-135. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/7738324

Kohn, L., Corrigan, J., & Donaldson, M. (Eds.). (2000). *To err is human: Building a safer health care system*. Washington, D.C: National Academy Press.

Landrigan, C. P., Rothschild, J. M., Cronin, J. W., Kaushal, R., Burdick, E., Katz, J. T., … Czeisler, C. A. (2004). Effect of reducing interns' work hours on serious medical errors in intensive care units. *New England Journal of Medicine, 351*(18), 1838-1848. doi:10.1056/NEJMoa041406

Lawton, R., & Parker, D. (2002). Barriers to incident reporting in a healthcare system. *Quality & Safety in Health Care, 11*(1), 15-18. doi:10.1136/qhc.11.1.15

Leape, L., Berwick, D., Clancy, C., Conway, J., Gluck, P., Guest, J., . . . Isaac, T. (2009). Transforming healthcare: A safety imperative. *Quality & Safety in Health Care, 18,* 424-428. doi:10.1136/qshc.2009.036954

Lewis, E., Baernholdt, M., & Hamrick A. (2013). Nurses' experience of medical errors: An integrative literature review. *Journal of Nursing Care and Quality, 28,* 153-161. doi:10.1097/NCQ.0b013e31827e05d1

Lincoln, Y. (1995). Emerging criteria for quality in qualitative and interpretative research. *Qualitative Inquiry, 1,* 275-289. doi:10.1177/107780049500100301

Lingard, L., Reznick, R., Espin, S., Regehr, G., & DeVito, I. (2002). Team communications in the operating room: Talk patterns, sites of tension, and implications for novices. *Academic Medicine, 77,* 232-237. doi:10.1097/00001888-200203000-00013

Loeb, J. M., & O'Leary, D. S. (2004). The fallacy of the body count: Why the interest in patient safety and why now? In B. J. Youngberg, & M. J. Hatlie (Eds.), *The patient safety handbook* (pp. 83-93). Sudbury, MA: Jones and Bartlett Publishers.

Lurk. (n.d.). In Merriam-Wesbter's online dictionary (11th ed). Retrieved from http://www.merriam-webster.com/dictionary/lurk

Lyndon, A. (2008). Social and environmental conditions creating fluctuating agency for safety in two urban academic birth centers. *JOGNN - Journal of Obstetric, Gynecologic, & Neonatal Nursing, 37*(1), 13-23. doi:10.1111/j.1552-6909.2007.00204.x

McCray, J. (2003). Leading interprofessional practice: A conceptual framework to support practitioners in the field of learning disability. *Journal of Nursing Management, 11,* 387-395. doi:10.1046/j.1365-2834.2003.00430.x

Meurier, C. E. (2000). Understanding the nature of errors in nursing: Using a model to analyse critical incident reports of errors which had resulted in an adverse or potentially adverse event. *Journal of Advanced Nursing, 32,* 202-207. doi:10.1046/j.1365-2648.2000.01444.x

Meurier, C. E., Vincent, C. A., & Parmar, D. G. (1997). Learning from errors in nursing practice. *Journal of Advanced Nursing, 26,* 111-119. doi:10.1046/j.1365-2648.1997.1997026111.x

Meurier, C. E., Vincent, C. A., & Parmar, D. G. (1998). Nurses' responses to severity dependent errors: A study of the causal attributions made by nurses following an error. *Journal of Advanced Nursing, 27,* 349-354. doi:10.1046/j.1365-2648.1998.00512.x

Michaelson, M., & Levi, L. (1997). Videotaping in the admitting area: A most useful tool for quality improvement of the trauma care. *European Journal of Emergency Medicine, 4*(2), 94-96. doi:10.1097/00063110-199706000-00007

Mikkelsen, J., & Holm, H. A. (2007). Contextual learning to improve health care and patient safety. Education for Health, 20(3), 1-9. Retrieved from http://www.educationforhealth.net/temp/EducHealth203124-6610159_182141.pdf

Mills, D. H. (1978). Medical insurance feasibility study. A technical summary. *Western Journal of Medicine, 128,* 360-365. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1238130/pdf/westjmed00260-0108.pdf

Mishra, A., Catchpole, K., Dale, T., & McCulloch, P. (2008). The influence of non-technical performance on technical outcome in laparoscopic cholecystectomy. *Surgical Endoscopy, 22*, 68-73. doi:10.1007/s00464-007-9346-1

Mitchell, P. H., & Shortell, S. M. (1997). Adverse outcomes and variations in organization of care delivery. *Medical Care, 35*(11), 19-32. Retrieved from http://journals.lww.com/lww-medicalcare/pages/default.aspx

Moses, L. E., & Mosteller, F. (1968). Institutional differences in postoperative death rates: Commentary on some of the findings of the National Halothane Study. *JAMA, 203*, 492-494. doi:10.1001/jama.1968.03140070048010

Munhall, P. L. (2007). *Nursing Reserach: A Qualitative Perspective* (4th ed.). Boston: Jones & Bartlett Publishers.

Nance, J. J. (2004). Admitting imperfection: Revelations from the cockpit for the world of medicine. In B. J. Youngberg & M. J. Hatlie (Eds.), *The Patient Safety Handbook* (pp. 187-203). Sudbury, MA: Jones and Bartlett Publishing.

National Patient Safety Foundation (NPSF). (1997). *Patient Safety Dictionary, F-M*. Retrieved from http://www.npsf.org/for-healthcare-professionals/resource-center/definitions-and-hot-topics/patient-safety-dictionary-f-m/

National Patient Safety Foundation (NPSF). (2010). *UMET NEEDS: Teaching physicians to provide safe patient care.* Lucian Leape Institute roundtable on reforming medical education. Boston, MA.: NPSF. Retrieved from http://www.npsf.org/wp-content/uploads/2011/10/LLI-Unmet-Needs-Report.pdf

Nelson, E. C., Batalden, P. B., Huber, T. P., Mohr, J. J., Godfrey, M. M., Headrick, L. A., & Wasson, J. H. (2002). Microsystems in healthcare: Part 1. Learning from high-performing front-line clinical units. The Joint Commission Journal on Quality Improvement, 28, 472–493. Retrieved from http://lsatqdm.qdmnet.com/qdm/microsystems/JQIPart1.pdf

Nieva, V. F., & Sorra, J. (2003). Safety culture assessment: A tool for improving safety in healthcare organizations. *Quality and Safety in Healthcare, 12(Suppl II), ii17-ii23.* doi:10.1136/qhc.12.suppl_2.ii17

Osborn, R., & Hagedoorn, J. (1997). The institutionalization and evaluationary dynamics of interorganizational alliances and networks. *Academy of Management Journal, 40*, 261-278. doi:10.2307/256883

Osmon, S., Harris, C. B., Dunagan, W. C., Prentice, D., Fraser, V. J., & Kollef, M. H. (2004). Reporting of medical errors: An intensive care unit experience. *Critical Care Medicine, 32*, 727-733. doi:10.1097/01.CCM.0000114822.36890.7C

Ottewill, M. (2003). Clinical governance: The current approach to human error and blame in the NHS. *British Journal of Nursing, 12*, 919-924. Retrieved from http://www.britishjournalofnursing.com/

Page, A. (Ed.). (2004). *Keeping patients safe: Transforming the work environment of nurses*. Washington, D.C.: The National Academies Press.

Pizzi, L. T., Goldfarb, N. I., & Nash, D. B. (2001). Promoting a culture of safety. In K. G. Shojania, B. W. Duncan, K. M. McDonald, & R. M. Wachter (Eds.). *Evidence Report/Technology Assessment No. 43: Making health care safer: A critical analysis of patient safety practices.* (pp. 442-451). Agency for Healthcare Research and Quality: USDHHS. Retrieved from http://www.ahrq.gov/clinic/ptsafety/chap40.htm

Poniatowski, L. E. (2004). Patient safety and error reduction standards: The JCAHO Reponse to the IOM Report. In B. J. Youngberg, & M. J. Hatlie (Eds.), *The patient safety handbook* (pp. 127-144). Sudbury, MA: Jones and Bartlett Publishers.

Pronovost, P.J., Holzmueller, C. G., Needham, D. M., Sexton, J. B., Miller, M., Berenholtz, S., ... Morlock, L. (2006). How will we know patients are safer? An organization-wide approach to measuring and improving safety. *Critical Care Medicine, 34*, 1988-1995. doi:10.1097/01.CCM.0000226412.12612.B6

Pronovost, P. J., Miller, M. R., & Wachter, R. M. (2006b). Tracking progress in patient safety: An elusive target. *JAMA, 296*(6), 696-699. doi:10.1001/jama.296.6.696

Pronovost, P. J., & Sexton, B. (2005). Assessing safety culture: Guidelines and recommendations. *Quality & Safety in Health Care, 14*, 231-233. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1744052/pdf/v014p00231.pdf

Pronovost, P. J., Weast, B., Holzmueller, C. G., Rosenstein, B. J., Kidwell, R. P., Haller, K. B., ... Rubin, H. R. (2003). Evaluation of the culture of safety: Survey of clinicians and managers in an academic medical center. *Quality & Safety in Health Care, 12*, 405-410. doi:10.1136/qhc.12.6.405

Quellette, J., & Wood, W. (1998). Habit and intention in everyday life: The multiple processes by which past behavior predicts future behavior. *Psychological Bulletin, 124,* 54-74. doi:10.1037//0033-2909.124.1.54

Rassin, M., Kanti, T., & Silner, D. (2005). Chronology of medication errors by nurses: Accumulation of stresses and PTSD symptoms. Issues Mental Health Nursing, 26, 873-886. http://dx.doi.org/10.1080/01612840500184566

Reason, J. (2000). Human error: Models and management. *BMJ, 320*(7237), 768-770. doi:10.1136/bmj.320.7237.768

Reason, J., Carthey, J., & de Leval, M. (2001). Diagnosing ‘‘vulnerable system syndrome:’’ An essential prerequisite to effective risk management. Quality and Safety in Health Care, 10, (Suppl. 2), ii21-ii25. doi:10.1136/qhc.0100021

Regenstein, M. (2004). Understanding the first Institute of Medicine report and its impact on patient safety. In B. J. Youngberg, & M. J. Hatlie (Eds.), *The patient safety handbook* (pp. 1-23). Sudbury, MA: Jones and Bartlett Publishers.

Ricci, M., Goldman, A. P., de Leval, M. R., Cohen, G. A., Devaney, F., & Carthey, J. (2004). Pitfalls of adverse event reporting in paediatric cardiac intensive care. *Archives of Disease in Childhood, 89,* 856-859. doi:10.1136/adc.2003.040154

Roberts, K. H. (1988). *Some characteristics of high reliability organizations*. Berkeley, CA: UCB Business School.

Roberts, K.H. (1993). Cultural charastericstics of relability enhancing organizations. *Journal of Managerial Issues, 5(2),* 165-181. Retrieved from http://www.jstor.org/stable/40603976

Ross, M. C., Smith, K. K., Smith, A., Ryan, R., Webb, L., & Humphreys, S. (2008). Analysis of after-action reporting by deployed nurses. Military Medicine, 173, 210-216. Retrieved from http://publications.amsus.org/

Rothschild, J. M., Landrigan, C. P., Cronin, J. W., Kaushal, R., Lockley, S. W., Burdick, ... Bates, D. W. (2005). The critical care safety study: The incidence and nature of adverse events and serious medical errors in intensive care. *Critical Care Medicine, 33,* 1694-1700. doi:10.1097/01.CCM.0000171609.91035.BD

Rowe, A., & Hogarth, A. (2005). Use of complex adaptive systems metaphor to achieve professional and organizational change. *Journal of Advanced Nursing, 51,* 396-405. doi:10.1111/j.1365-2648.2205.03510.x

Rowin, E. J., Lucier, D., Pauker, S. G., Kumar, S., Chen, J., & Salem, D. N. (2008). Does error and adverse event reporting by physicians and nurses differ? *The Joint Commission Journal on Quality and Patient Safety, 34,* 537-545. Retrieved from http://www.jcrinc.com/

Rynes, S., McNatt, D., & Bretz, R. (1999). Academic research inside organizations: Inputs, processes, and outcomes. *Personnel Psychology, 52*, 869-989. doi:10.1111/j.1744-6570.1999.tb00183.x

Sanazaro, P. J., & Williamson, J. W. (1970). Physician performance and its effects on patients: A classification based on reports by internists, surgeons, pediatricians, and obstetricians. *Medical Care, 8*, 299-308. doi:10.1097/00005650-197008040-00006

Santora, T. A., Trooskin, S. Z., Blank, C. A., Clarke, J. R., & Schinco, M. A. (1996). Video assessment of trauma response: Adherence to ATLS protocols. *American Journal of Emergency Medicine, 14*, 564-569. doi.org/10.1016/S0735-6757(96)90100-X

Saxton, T. (1997). The effects fo partner and relationship characteristics on alliance outcomes. *Academy of Management Journal, 40*, 443-462. doi:10.2307/256890

Scott, S., Hirschinger, L., Cox, K., McCoig, M., Brandt, J., & Hall, L. (2009). The natural history of recovery for the healthcare provider "second victim" after adverse patient events. *Quality and Safety in Health Care, 18*, 325-330. doi:10.1136/qshc.2009.032870

Sexton, J. B., Thomas, E. J., & Helmreich, R. L. (2000). Error, stress, and teamwork in medicine and aviation: Cross sectional surveys. *BMJ, 320*, 745-749. doi:10.1136/bmj.320.7237.745

Shannon, S. E., Foglia, M. B., Hardy, M., & Gallagher, T. H. (2009). Disclosing errors to patients: Perspectives of registered nurses. Joint Commission Journal on Quality and Patient Safety, 35(1), 5-12. Retrieved from http://www.macrmi.info/files/8113/5481/5437/disclosure_and_RNs._JCJQS2009_copy.pdf

Sirriyeh, R., Lawton, R., Gardner, P., & Armitage, G. (2010). Coping with medical error: a systematic review of papers to assess the effects of involvement in medical errors on healthcare professionals' psychological well-being. *Quality and Safety in Health Care, 19* (e43).1-8. doi:10.1136/qshc.2009.035253

Small, S. D., & Barach, P. (2002). Patient safety and health policy: A history and review. *Hematology/Oncology Clinics of North America, 16*, 1463-1482. doi:10.1016/S0889-8588(02)00066-7

Spath, P. (2000, June). Does your facility have a 'patient safe' climate? *Hospital Peer Review, 25,* 80-82. Gale Cengage Learning.

Spears, P. T. (2002). *Stories nurses tell about patient care error.* Memphis, TN: University of Tennessee Health Sciences Center.

Stratton, K. M., Blegen, M. A., Pepper, G., & Vaughn, T. (2004). Reporting of medication errors by pediatric nurses. *Journal of Pediatric Nursing, 19*, 385-392. doi.org/10.1016/j.pedn.2004.11.007

Strauss, A. (1987). *Qualitative analysis for social scientists*. Cambridge, UK: Cambridge University Press.

Strauss, A., & Crobin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.

Suddaby, R. (2006). What grounded theory is not. *Academy of Management Journal, 49*, 633-642. doi:10.5465/AMJ.2006.22083020

Szekendi, M. K., Sullivan, C., Bobb, A., Feinglass, J., Rooney, D., Barnard, C., & Noskin, G. A. (2006). Active surveillance using electronic triggers to detect adverse events in hospitalized patients. *Quality & Safety in Health Care, 15*, 184-190. doi:10.1136/ashc.2005.0145989

Tami, G., Bruria, A., Fabiana, E., Tami, C., Tali, A., & Limor, A. (2013). An after-action review tool for EDs: Learning from mass casualty incidents. American Journal of Emergency Medicine, 31, 798-802. http://dx.doi.org/10.1016/j.ajem.2013.01.025

Tannenbaum, S. I., & Cerasoli, C. P. (2013). Do team and individual debriefs enhance performance? A meta-analysis. Human Factors: The Journal of the Human Factors and Ergonomics Society, 55. 231-245. http://dx.doi.org/10.1177/0018720812448394

Tanner, C. (2006). Thinking like a nurse: A Research-based Model of Clinical Judgment in Nursing. Journal of Nursing Education,45(6). 204-211. Retrieved from: http://content2.learntoday.info/ben/NRHL620_2013/Media/TF_0692810354_thinking%20like%20a%20nurse.pdf

Taylor, J. A., Brownstein, D., Christakis, D. A., Blackburn, S., Strandjord, T. P., Klein, E. J., & Shafii, J. (2004). Use of incident reports by physicians and nurses to document medical errors in pediatric patients. *Pediatrics, 114*, 729-735. doi:10.1542/peds.2003-1124-L

The Joint Commision. (2011). *Facts about the Joint Commission*. Retrieved from http://www.jointcommission.org/facts_about_the_joint_commission/

Thomas, E. J., Sexton, J. B., Neilands, T. B., Frankel, A., & Helmreich, R. L. (2005). The effect of executive walk rounds on nurse safety climate attitudes: A randomized trial of clinical units. *BMC Health Services Research, 5*, 28-37. doi:10.1186/1472-6963-5-46

Thomas, E. J., Sherwood, G. D., Mulhollem, J. L., Sexton , B. J., & Helmreich, R. L. (2004). Working together in the neonatal intensive care unit: Provider perspectives. *Journal of Perinatology, 24*, 552-559. doi:10.1038/sj.jp.7211136

Thomas, E. J., Studdert, D. M., Newhouse, J. P., Zbar, B. I., Howard, K. M., Williams, E. J., & Brennan, T. A. (1999, fall). Costs of medical injuries in Utah and Colorado. *Inquiry, 36*, 255-264. Retrieved from http://www.jstor.org.proxy2.ulib.iupui.edu/stable/pdfplus/29772835.pdf?acceptTC=true&acceptTC=true&jpdConfirm=true

Tugade, M. M., & Fredrickson, B. L. (2004). Resilient individuals use emotions to bounce back from negative emotional experiences. Journal of Personality and Social Psychology, 86, 320–333. Retrieved from: http://dx.doi.org/10.1037/0022-3514.86.2.320

Uribe, C. L., Schweikhart, S. B., Pathak, D. S., Dow, M., Marsh, G. B., Uribe, C. L., & Marsh, G. B. (2002). Perceived barriers to medical-error reporting: An exploratory investigation. *Journal of Healthcare Management, 47*, 263-280. Retrieved from http://www.ache.org/pubs/jhm/jhm_index.cfm

Victor-Chmil, J. (2013). Critical Thinking versus Clinical Reasoning versus Clinical Judgment. Nurse Educator, 38 (1). 34-36. doi: 10.1097/NNE.0b013e318276dfbe

Viney, M., Batcheller, J., Houston, S., & Belcik, K. (2006). Transforming care at the bedside: Designing new care systems in an age of complexity. *Journal of Nursing Care Quality 21*, 143-150. Retrieved from http://journals.lww.com/jncqjournal/pages/default.aspx

Waring, J. J. (2005). Beyond blame: Cultural barriers to incident reporting. *Social Science & Medicine, 60*, 1927–1935. doi:org/10.1016/j.socscimed.2004.08.055

Wu, A. (2000). Medical error: The second victim. *BMJ, 320*, 726-727. doi:10.1136/bmj.320.7237.726

Wu, A., Folkman, S., McPhee, S., & Lo, B. (1993). How house officers cope with their mistakes. *The Western Journal of Medicine 159*, 565–569. Retrieved at: http://www-ncbi-nlm-nih-gov.proxy.medlib.iupui.edu/pmc /articles/PMC1022346/pdf/westjmed00075-0037.pdf

Zimmerman, B., Lindberg, C., & Plsek, P. (2008). *Edgeware: Insights from complexity science for health care leaders* (1st ed.). Irving, TX: HVA Inc.

CURRICULUM VITAE

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EDUCATION:
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Bachelor of Arts Baker University, 1991
Bachelor of ScienceBethel College, 1993

Graduate:
Master of Science University of Colorado, 2001
Doctor of Philosophy, Nursing, Indiana University, 2014

ACADEMIC APPOINTMENTS:
Gonzaga University, Spokane, WA
Online faculty 2012 - present

Indiana University School of Nursing
Clinical Lecturer 2005 - 2012

TEACHING ASSIGNMENTS:
NURS 354 Creating Healthy Work Environments, Gonzaga University
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CLINICAL APPOINTMENTS:
Indiana University School of Medicine
Dept of Pediatrics, Section of Neonatology
Neonatal NP2004 – present

LICENSURE:
State of Indiana (RN/NP)
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CERTIFICATIONS:
- Certified Neonatal Nurse Practitioner current
- Newborn Resuscitation Program (NRP) current
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PROFESSIONAL SOCIETIES
Nataional Association of Neonatal Nurses
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SERVICE:

Current
Peer reviewer for ANN and NANN professional journals

2012 - 2013
On-site mentor for NNP students in distance programs through Rush University and Vanderbilt University

2008 - 2010
One of two-person team of primary mentor for orientation of student and newly graduated NNPs

2009, 2013
Participated in the NANN Task Force for Revision of NNP Education Standards

2006 - 2008
Presented on multiple neonatal topics to Central Indiana Association of Neonatal Nurses (CIANN)

RESEARCH:

2008 - 2014
PhD Dissertation: *To Report or Not Report: A Qualitative Study of Nurses' Decisions in Error Reporting* - Indiana University School of Nursing, Indianapolis, IN.

2007
AHRQ Hospital Survey on Patient Safety Culture, surveyed staff in the Riley Hospital Newborn Intensive Care Unit regarding their attitudes/perceptions of patient safety culture.

1999 - 2001
Clinical study: "Use of Chemical Warming Mattress in the Delivery Room to Prevent Hypothermia in Premature, Very-low Birth weight Infants"

PUBLICATIONS:

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