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Patient Safety Culture and High Reliability Organizations

Jared D. Padgett
Walden University

Walden University

College of Management and Technology

This is to certify that the doctoral study by

Jared D. Padgett

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Review Committee
Dr. Kenneth Gossett, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Lisa Kangas, Committee Member, Doctor of Business Administration Faculty

Dr. Judith Blando, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2014

Abstract

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MBA, Western International University, 2011

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Doctoral Study Submitted in Partial Fulfillment

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Abstract

A 1999 evaluation of case studies performed by staff from the Institute of Medicine found that between 40,000 and 98,000 patients died from preventable errors, while 43,598 individuals died in car accidents that year. A 2011 report increased that estimate nearly 10 times. Widespread preventable patient harm still occurs despite an increase in healthcare regulations. High-reliability organization theory has contributed to improved safety and may potentially reverse this trend. This explorative single case study explored how the perceptions and experiences of nursing and respiratory staff affected the successful transition of a healthcare organization into a reliability-seeking organization. Fourteen participants from a subacute nursing facility in the western United States were selected using purposeful criterion sampling. Data were collected through participant interviews, document review, and group observation. Data were then analyzed through open coding of frequently used words or themes, and through memoing and selected coding. Key themes uncovered in the study were the need for extensive education and training, communication, and teamwork to improve patient safety. The findings of the study contribute to social change by enhancing awareness of safety and quality issues that staff should focus on in a health care setting. Study data are useful to business leaders seeking to improve staff morale, to reduce costly errors in care, and to enhance leadership from the bottom-up to promote a culture of safe patient care.

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ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

Dedication

This doctoral study is dedicated to my parents, Doug and Cindy Padgett, who have supported me in every pursuit. I also dedicate this study to my wife, Kate, and children, Benjamin, Liam, and Cailin Padgett for your love and support, and for keeping me anchored as I completed two graduate programs.

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Section 1: Foundation of the Study

Preventable medical harm is a multi-faceted problem. In addition to the physical harm done to patients resulting from errors in care, there are significant financial and operational costs to an organization engaged in unsafe care (Colón-Emeric et al., 2010). In 2012, analysts estimated the annual punitive costs of preventable errors at close to $38 billion (Debourgh & Prion, 2012). These costs affect nursing homes and other small organizations more than they affect larger organizations because payments for services are contingent on meeting certain standards (Colón-Emeric et al.). Smaller organizations are more affected because they are less likely to have reserve funding to maintain operations when payers withhold funding. Punitive costs include both lawsuits and the higher insurance rates that result from lawsuits related to preventable errors in care (Debourgh & Prion). These factors have collectively led to the rising costs of providing safe care as physicians and other care practitioners seek shelter from lawsuits and practice defensive medicine (Catino, 2009). Smaller organizations additionally face increased regulatory scrutiny beyond that of larger organizations (Colón-Emeric et al.).

Background of the Problem

A seminal report issued by the Institute of Medicine (IOM) in 1999 indicated that preventable medical harm was a serious problem in the United States. In this report, Institute of Medicine analysts estimated that up to 98,000 people died annually in the U.S. from avoidable medical errors (Chassin & Loeb, 2013). In contrast, 43,598 individuals died from car accidents, and only 319 died in commercial aviation accidents in the same year (Bagnara, Parlangeli, & Tartaglia, 2010). The IOM estimate was

multiplied ten times based on new research in 2011 (Andel, Davidow, Hollander, & Moreno, 2012). Preventable medical harm remains a persistent problem today (Diller et al., 2013). Many healthcare administrators and regulators have initiated changes without making significant progress (Diller et al.; Sheps & Cardiff, 2011). However, some administrators have resisted this trend and made progress in reducing preventable errors.

There are several notable examples of success. One healthcare organization that has successfully reduced preventable errors determined that it averted 1,500 error-related deaths in fiscal year 2010, and sought to build on this level of success (Pryor, Hendrich, Henkel, Beckmann, & Tersigni, 2011). Another example, a pediatric intensive care unit, quickly grew to one of the largest care units in the United States, and maintained a mortality rate lower than the rates of smaller organizations (van Stralen, 2008). Both of these organizations attributed their respective successes to High Reliability Organization (HRO) theory (Pryor et al.; van Stralen). These organizations are exceptions, however, in improving patient safety; the industry as a whole remains largely unchanged.

In another example of an exceptional healthcare organization, the medical director of a small sub-acute nursing facility initiated a transformation toward organizational reliability (van Stralen, Calderon, Lewis, & Roberts, 2008). The goal was to integrate HRO theory into the organizational culture to improve safety. Altering the authority structure resulted in increased communication, trust, and cooperation. During this transition, the organization reduced 911 emergency calls, installed Intensive Care Unit (ICU) type ventilators, and provided the means for chronically ill, technology-dependent

pediatric patients to smile and play. The improvement in patient safety that resulted from the organizational transition toward reliability provides the background for this study.

Problem Statement

Unsafe patient care incurs high costs and presents a significant general business problem. Errors in patient care present an increasing risk to patients and to healthcare organizations, despite significant efforts to improve safety for more than 14 years (Chassin & Loeb, 2013). Case studies evaluated by the Institute of Medicine (IOM) in 1999 indicated that 4-16% of patients have suffered avoidable harm (Institute of Medicine [IOM], 1999), and these numbers have not improved significantly since that time (Bion, Abrusci, & Hibbert, 2010). Healthcare organizations face increased scrutiny from the governmental entities created in response to the IOM report. Though regulation has increased, improvements in patient safety have only progressed incrementally. The specific business problem that this study addresses is the need for healthcare organizations to improve patient safety and reduce operational costs while complying with regulatory and governmental organizations.

Purpose Statement

This qualitative, explorative single case study examined how the perceptions and experiences of nursing and respiratory staff affected the successful transition of a healthcare organization into a reliability-seeking organization. It was designed to identify how the application of HRO theory was understood and applied by frontline staff during the organizational transition toward reliability. Fourteen nursing and respiratory staff were selected through purposeful criterion sampling from a sub-acute nursing facility in

the western United States with 480 employees. Additional data were obtained through group observation of staff interactions and document review.

The study was designed to collect information that can be used to implement and reinforce patient safety culture. Its findings can be used to promote positive social change by reducing incidents of harm and saving lives. This culture change has other potential benefits for healthcare organizations seeking to reduce operational risk in areas outside patient safety. The interdisciplinary nature of HRO theory is expected to allow application of the study findings to benefit several areas of business practice, including patient care and organizational management. The findings from this study also add to the growing body of knowledge about improving safety and reducing risk.

Nature of the Study

I selected a qualitative, explorative case study to explore how the perceptions and experiences of nursing and respiratory staff affected an organizational transition toward reliability. This approach was best suited to answer the research question. Other methods and designs were excluded because they were not suitable to address the research question.

The qualitative research method was appropriate for this study. Qualitative studies are used to ask why or how something has occurred (Shuval et al., 2011). The qualitative method was selected for this study because the purpose was to explore how the perceptions and experiences of nursing and respiratory staff affected a successful organizational transition toward reliability. A quantitative study is useful to ask what has happened, but does not provide insight into why. In healthcare, the status of a patient may

be determined through quantitative data, but the processes and organizational movements that led to the implementation of changes in care are better understood using qualitative studies (Yin & Davis, 2007).

Quantitative and mixed methods were not selected for this study. Quantitative data is useful for evaluating cause and effect, understanding the relationships between variables, and projecting results onto a larger population (Watkins, 2012). Researchers use qualitative data to explore motivations, perceptions, and decision processes that lead to observable phenomenon (Watkins). Qualitative and quantitative methods are complementary and may be used together in mixed methods research. Researchers use mixed methods data to complete the picture of a phenomenon, and how the phenomenon occurred (Denzin & Lincoln, 2011). Mixed method research requires full data sets from each method (Watkins, 2012). Qualitative data were most relevant for exploring how the perceptions and experiences of nursing and respiratory staff affected the organizational transition toward reliability because the staff could explain their perceptions, motivations, and decision processes.

The flexible structure of qualitative research (Yin, 1999) allows researchers to explore the case in depth. Qualitative research may provide a better way of telling the story about what happened (Rubin & Rubin, 2012), which is an advantage over quantitative research. The data gathered in this study was useful in telling the story of how the culture changed within the organization from the perspective of frontline staff. Describing how the change occurred was useful in completing the story told in prior

studies, which indicated that the culture changed (van Stralen, Calderon, Lewis, & Roberts, 2008).

The qualitative method can be applied to a number of research designs. The explorative, single case study design was selected for this study. In a study designed to reflect on the change of culture in an organization, an ethnographic study could be suitable (Watkins, 2012). Case studies and ethnographic studies are similar because both are used to emphasize context (Houghton, Casey, Shaw, & Murphy, 2013). An ethnographic study requires more time than was available for this study and was not the ideal design. Instead, an explorative single case study design was used to help provide a picture of the organizational culture before, during, and after the cultural transition occurred.

Another design that was not selected was a phenomenological design. Phenomenological studies are suitable to describe a shared experience or an event (Watkins, 2012). Though culture change is a phenomenon with a shared experience, phenomenology does not address context. Context is important in understanding the perceptions and experiences of individuals who lived through the phenomenon (Watkins). The explorative single case study provided richer data than could be obtained studying the phenomenon alone. A case study design was more appropriate for this study than a phenomenological design.

The single case study design was also more appropriate than a grounded theory design. Grounded theory is also used to understand a shared phenomenon (Watkins, 2012). Grounded theory is designed to develop new theory based on these shared

experiences. The organizational change represented in this study was connected to existing theory (van Stralen, Calderon, Lewis, & Roberts, 2008). New theory was not needed for this study. Grounded theory would not be an appropriate choice. Instead, a case study can be used to expand existing theory or to confirm prior discoveries (Houghton, Casey, Shaw, & Murphy, 2013), which made the explorative single case study the best option for this study.

Research Question

The research question investigated in this study was: How did the perceptions and experiences of nursing and respiratory staff affect the successful transition of a healthcare organization into a reliability-seeking organization? The following research sub-questions were also addressed in this study.

1. What components of High Reliability Organization (HRO) theory were useful in reducing risk to patient safety in a sub-acute nursing facility?
2. How did the nursing and respiratory staff contribute to changes that led to an improvement of patient safety in a sub-acute nursing facility?
3. How did the attitude of nursing and respiratory staff affect participation in the application of HRO theory?

The research question may be addressed in a qualitative case study design using interviews, observations, and document review (Watkins, 2012; Denzin & Lincoln, 2011). Data were collected through individual interviews, group observation of interactions between nursing and respiratory staff, and through review of existing data and organizational documents. The following interview questions were used:

Interview Questions

Qualifying Questions

1.) What is your job function at this facility?

2.) How long have you been working here?

Interview Questions

1.) What was the safety culture like at the organization before HRO was introduced?

2.) Describe the current safety culture in the organization.

3.) How did you perceive your role in the safety of your patients before learning about HRO?

4.) Describe how you see your role in the safety of your patients now.

5.) Describe your interactions with members of other departments before HRO was adopted.

6.) How did your interactions with these other departments change after learning about HRO?

7.) Describe how your daily tasks changed during the transition.

8.) Describe any policies or procedures that changed as a result of the transition.

9.) Describe how the managers and administrators handled the transition process.

10.) Describe the communication between departments since HRO was introduced.

11.) What influence did the application of HRO theory have in improving patient safety?

12.) In what way did the shift toward reliability affect your perception of the organization?

13.) How did the shift toward reliability affect your perception of your job?

14.) How could the transition have been managed better?

15.) How has HRO helped improve the lives of the patients?

16.) What components of HRO theory have been useful in reducing risks to patient safety?

17.) Describe any cost savings you are aware of since HRO was introduced.

18.) What were the most important improvements in patient safety since the transition toward reliability?

19.) What advice would you give to a new staff member who is first learning about HRO?

20.) What advice would you give someone who is first learning about HRO in another organization?

21.) What other information would be useful to understand HRO theory may be implemented to improve patient safety?

Conceptual Framework

High Reliability Organization theory comprises several foundational principles that together promote a culture of safety. These principles include: (a) developing and maintaining standard processes, (b) implementing checks and redundancy to mitigate potential failure, (c) authority migration, and (d) developing teams that openly communicate about failure to prevent recurrence of unsafe incidents (Hartmann, Meterko,

Zhao, Palmer, & Berlowitz, 2013). It was developed by researchers from the University of California, Berkeley in an attempt to understand why high-risk organizations do not fail (Bourrier, 2011; Sutcliffe, 2011). Researchers from the University of Michigan and Naval Postgraduate School also contributed to HRO theory (van Stralen, 2008; van Stralen, Calderon, Lewis, & Roberts, 2008). Carolyn Libuser developed some of the initial concepts of HRO theory, and subsequent researchers refined and further contributed to the theory (van Stralen et al.).

Researchers have described HRO as either a status or a process. Though the early iterations of HRO theory indicated that an organization may become an HRO, an organization should instead be described as reliability-seeking (Sutcliffe, 2011). While HRO status is a goal, the ongoing vigilance required to maintain or improve safety means the target is always moving. An organization is considered reliability-seeking when the individuals making up the organization are preoccupied with failure and actively work toward building and enhancing a culture of safety (Bigley & Roberts, 2001; Roberts & Bea, 2001; Weick, Sutcliffe, & Obstfeld, 1999).

HRO theory is applicable to many industries. The theory was implemented successfully within the aviation, nuclear power, military, and public safety industries (Casler, 2013; O'Neil & Kriz, 2013). HRO theory is also gaining ground in healthcare (Chassin & Loeb, 2013), though the penetration within the industry is still limited. HRO influences the rate of patient safety indicators (PSIs) in an organization (Singer, Lin, Falwell, Gaba, & Baker, 2009), human error attributable to fatigue and stress (Norris,

Currie, & Lecko, 2012), and development of interdepartmental teams with open channels of communication (Riley, Davis, Miller, & McCullough, 2010).

HRO theory was selected as the conceptual framework because it was the foundational theory used to implement the culture change in the organization examined in this study as a part of the organizational transition toward reliability. The data collected for this study should be evaluated within its context. Using HRO theory as the conceptual framework helped provide insight into how the perceptions and experiences of nursing and respiratory staff affected the organizational transition toward reliability.

Definition of Terms

Blame culture: An organizational tendency to assign blame to individuals when errors occur that reduces communications, indemnifies the organization, reduces opportunities for organizational learning, and leads to additional errors (Goh, Chan, & Kuziemsky, 2013).

High-reliability organization (HRO): An organization that conducts operations with minimal error, over an extended time, and consistently makes good decisions that result in both high quality and high reliability (Roberts, 1990).

Human factors: A descriptive term indicating that human physical or mental capacities have reached a maximum limit, leading to a system error (Norris, Currie, & Lecko, 2012).

Incident command system (ICS): An approach that provides an emergency professional the authority to control and deploy resources from various supporting

response teams outside their normal jurisdiction to manage emergencies and disasters (Bigley & Roberts, 2001).

Mindfulness: The ability to grasp and remember current objects, without interference through distraction, wandering thoughts, or associative thinking (Dane, 2011).

Non-technical skills: Interpersonal or common sense skills that do not directly pertain to the professional training of medical care staff (White, 2012).

Observed-to-expected mortality ratio: A ratio derived from dividing observed mortality by expected mortality to determine how a system performs based on the expected outcome of high-risk patients (Pryor, Hendrich, Henkel, Beckmann, & Tersigni, 2011).

Organizational culture: A shared set of behaviors, goals, and language to establish a common goal between an organization and individuals within that organization (Alhatmi, 2011).

Patient safety indicators (PSIs): Units of measurement used for analysis to screen and predict preventable adverse events (Downey, Hernandez-Boussard, Banka, & Morton, 2012).

Patient hand-off: The process by which information relating to the patient's care is transferred from one responsible party to another to provide continuity of care (Gogan, Baxter, Boss, & Chircu, 2013).

Patient safety culture: The collective set of practices, beliefs, and goals of an organization and the individuals who make up the organization, centered on a shared interest in reducing error and providing safe care (Weaver et al., 2013).

Reliability: A process measurement used to determine whether a stated goal is met for a specified amount of time (Bion, Abrusci, & Hibbert, 2010).

Reliability-seeking: Because HRO is an ongoing process rather than an achievement, an organization that practices HRO is considered reliability-seeking and not an HRO (Sutcliffe, 2011).

Safety: A common term used in healthcare and other industries to indicate the minimization of error (Bion, Abrusci, & Hibbert, 2010).

Sense-making: Paying attention to multiple sources of information and making sense of them in the moment, rather than after a failure (Roberts & Bea, 2001).

Team hand-off: The transfer of information relevant to a patient's care between caregivers that occurs during shift changes, patient transfers, and admissions processes (Gogan, Baxter, Boss, & Chircu, 2013).

The 10+3 rule: A sample size criterion rule for qualitative research designed to confirm saturation has been achieved based on both a pre-determined minimum sample size and a minimum threshold for unique information beyond saturation (Francis et al., 2010).

Assumptions, Limitations, and Delimitations

Assumptions

Researcher assumptions can influence the conduct of research (Kirkwood & Price, 2013). Researchers should identify assumptions to provide the context in which the researcher analyzed data. The identification of assumptions can provide insight into the outcome of a study, and helps identify researcher bias. Some level of bias is appropriate, however, as it contributes to understanding of the topic (Hodges, 2011). Understanding the assumptions and biases of a researcher helps in evaluating the strength of the study.

In this study, there were four assumptions: (a) the participant would be able to recall participation in the organizational transition, (b) the participant would perceive this transition as positive, (c) the current organizational culture would reflect continued movement toward reliability, and (d) participants would provide open and honest responses to the interview questions. In a qualitative study, these assumptions may change over time, and may subsequently be adjusted to match the real circumstance within the organization. The data collected from interviews were used to determine the validity of these assumptions.

Limitations

Data were obtained from the staff of a small, sub-acute nursing facility. However, because there are applications for larger facilities and hospitals, further research within the context of these larger organizations may be required. The collected data came from a small group of participants within the target organization. A larger group may yield different results or could further support the findings in this study.

A perceived limitation of the case study design is a lack of generalizability (Yin, 2009). Yin described the similarities in the way empirical studies and qualitative studies build upon prior work. The new work adds to the generalization of findings. Future research in other organizations may build on this data and expand the generalizability of this study.

Qualitative case studies are intentionally set within a specific context (Sangster-Gormley, 2013), which may contribute to a misconception about applications in other areas. This study may be perceived to be valuable only within the context of small sub-acute nursing organizations. The interdisciplinary nature of HRO theory mitigates this limitation. Frontline workers may alert their supervisors to risk irrespective of a specific industry (Mauelshagen, Denyer, Carter, & Pollard, 2013). HRO may be applied within an organization, and to external organizations.

Organizations may also perceive value as relevant to the specific geographic area. Although healthcare regulations vary within the United States and internationally, the international and interdisciplinary nature of HRO mitigates this perceived limitation. Patients across international boundaries are at risk, which further reduces the geographic limitation of this study (Bernal-Delgado et al., 2012; Drösler, Romano, Tancredi, & Klazinga, 2012).

Delimitations

The population for this study was limited to the nursing and respiratory staff of a specific sub-acute nursing facility, employed before and after the organization's cultural transition toward high reliability, and who experienced the organizational culture change.

Nursing and respiratory staff that did not experience the transition were excluded from this study. Excluding ineligible participants ensured the data obtained addressed the research question.

Management and administrative staff members who were in those roles at the time of the transition were also excluded from participation. Excluding this group limited the data to the nursing and respiratory staff. The experiences and perceptions of the management and administrative staff were beyond the scope of this study, though this section of the population may be valuable in a future study. Current managers who were not managers at the time of the organizational transition were eligible to participate.

Significance of the Study

Contribution to Business Practice

Providing unsafe care is costly (Debourgh & Prion, 2012). Improving patient safety will reduce malpractice suits, high insurance rates, and punitive costs. More than $5 billion each year might be saved by improving patient safety (Brown & Wolosin, 2013). Improving patient safety might also reduce employee turnover and the costs associated with hiring and training new staff (O'Bierne, Sterling, Palacios-Derflingher, Hohman, & Zwicker, 2012). The application of HRO theory might limit workplace bullying or mitigate disruptive staff members, both of which undermine attempts to improve safety (Reiter III, Pichert, & Hickson, 2012). With these reduced risks, an organization might experience an improved reputation, and might be seen as a leader in its industry - which could increase revenues. Improving patient safety benefits the patients and the organization.

Implications for Social Change

The implications for positive social change include: (a) the quality of life for patients will improve in other healthcare organizations; (b) physicians might learn to adjust ventilator settings rather than sedate ventilator-dependent patients; (c) previously underserved patients will receive improved care; (d) care providers might be encouraged to participate actively in patient safety initiatives; and (e) pediatric patients once confined to their beds or sedated might be enabled to play like healthy children (van Stralen, Calderon, Lewis, & Roberts, 2008). This improvement helps to extend the possibilities (Hjorth, 2013) for the patient to enjoy an improved quality of life. Caregivers and patients benefit from improved safety culture and reduced error.

A Review of the Professional and Academic Literature

The literature review in this study supports the research question: How did the perceptions and experiences of nursing and respiratory staff affect the successful transition of a healthcare organization into a reliability-seeking organization? The literature review examines patient safety and related issues and concepts. It assesses the business case for improving patient safety, and describes the concepts of organizational culture with HRO safety culture. There is also an exploration of HRO theory, the conceptual framework used in the study. Criticisms of HRO theory and competing theories are also discussed. Finally, literature regarding the research method and design is presented.

The literature review discovered a large amount of information on the issue of patient safety. A WorldCat query for patient safety yields more than 200,000 resources. A

query for High Reliability Organizations yields more than 15,000 resources. Combining patient safety and High Reliability Organizations returns approximately 500 resources. These search results suggest that research on implementing HRO theory in healthcare is a comparatively small segment of the overall patient safety corpus.

Online search queries were conducted in the research databases available through Google Scholar, WorldCat, the Walden University Library, and the Pepperdine University Libraries. The keywords used in these searches included: (a) patient safety, (b) safety culture, (c) High Reliability Organizations, (d) HRO, (e) High Reliability Organizations and patient safety culture, (f) HRO theory, (g) safety culture and business, (h) culture change (i) Six Sigma and patient safety, and (j.) Normal Accident Theory. These results were filtered to represent a date range from 2010-2014, and by peer-reviewed materials. The filtered results limited the available resources to current, scholarly materials. The filtered search results included articles from healthcare and business journals, including the *Association of Operating Room Nurses (AORN) Journal*, *European Journal of Cardio-Thoracic Surgery*, *Qualitative Health Research*, *Business Process Management Journal*, *New England Journal of Medicine*, and *Business Process Management Journal*. The majority of the sources used in this literature review were found in current, peer-reviewed journal articles.

HRO researchers provided insight into incorporating HRO theory into an existing business or healthcare setting, but a gap exists regarding the transformation of an organization or the creation of a new reliability-seeking organization (van Stralen, Calderon, Lewis, & Roberts, 2008). A greater gap exists in the literature concerning the

application of HRO theory to nursing homes and small healthcare organizations. This study will be useful in addressing these gaps in the research while incorporating the valuable information already gathered in the academic literature.

Patient safety culture is also well-established in healthcare research, but nursing homes and other small healthcare facilities remain underrepresented. In both large and small organizations, the safety climate appears to be connected with improved safety indicators (Zúñiga, Schwappach, De Geest, & Schwendimann, 2013). Zúñiga et al. differentiated between a more general safety climate, and a specific safety culture that represents the safety climate. Safety climate is typically measured quantitatively, and safety culture can be assessed with qualitative research. Zúñiga et al. also indicated a need for research on drawing connections between safety culture and specific changes to care in a nursing home setting. Groups within an organization may perceive differences between the organizational safety climate and their own departmental safety climate. Understanding how each department perceives their role in the organizational safety climate is useful to organizations seeking to change the climate.

Patient Safety

Although the seminal 1999 report by the IOM on patient safety errors indicated a need for drastic changes in healthcare, patients safety errors remain virtually unchanged (Dickson, & Flynn, 2012; Sheps & Cardiff, 2011; Bion, Abrusci, & Hibbert, 2010). Sheps and Cardiff attributed the lack of progress to a false assumption that quality and improved safety are equivalent (Sheps & Cardiff). Clark et al. (2012) attributed the lack of progress to the increasing complexity of care, high turnover, or a general lack of

training in interdepartmental communication. One response in the medical community to the IOM report was an emphasis on quality improvement, but this has not translated into improved patient safety.

Another outcome of the 1999 IOM report was a reinforcement of the unrealistic expectation of mandatory perfection placed on physicians. Medical professionals are taught to be perfect, and that error is not an option (Sheps & Cardiff, 2011). An unintended consequence of this expectation leads to wall-building and the creation of silos, which reduces open communication and teamwork (Sheps & Cardiff). Physicians have withdrawn and limited communication with their teams because of an unrealistic expectation that physicians perform their duties without error.

Patient safety indicators. Patient safety has not improved across the industry despite regulators' significant efforts to promote reform. Although some improvements were made, in a study of patient safety indicators (PSIs) the authors indicated that there was a downward trend in patient safety between 1998 and 2007 (Downey, Hernandez-Boussard, Banka, & Morton, 2012). If patient safety has failed to improve, current efforts to effect change are not working.

The improvement of patient safety is a global concern. Standards vary by location, which makes communication between international organizations difficult. Pooling international knowledge and using similar terminology could help reduce errors on a larger scale. Drösler, Romano, Tancredi, and Klazinga (2012) discussed the comparison of Patient Safety Indicators (PSIs) at an Organization for Economic Co-Operation and Development conference. PSI data varies between countries because of

different collection methods, a different emphasis on specific medical outcomes or diagnoses, and the consistency in data collection. The Organization for Economic Co-Operation and Development (OECD) adopted 21 of the 59 indicators of patient safety. Consistent documentation and improved international cooperation will help to enhance patient safety. Sharing PSI data may not be the only option for sharing information internationally.

Some researchers have questioned if PSI data correlates with errors (Tsang, Palmer, Bottle, Aylin, & Majeed, 2012). Gathering PSI data is challenging because some states require specific data that may not be generalizable on a national scale. New York and California are sources of extensive data, but other states collect information directly applicable to their own region which limits generalizability. Incorporating similar processes internationally is challenging (Bernal-Delgado et al., 2012). Researchers also question the effectiveness of PSI data in evaluating safety (Bernal-Delgado et al.). Further research is needed to determine how effective PSIs are at preventing error.

Team hand-offs. The team hand-off is especially important in keeping patients safe. A hand-off involves the transfer of information that is relevant to the patient's care, at times when increased distractions provide opportunities for failure (Gogan, Baxter, Boss, & Chircu, 2013). These times include shift changes, admissions and discharges, and any other event where patient data needs to be transferred (Gogan, et al.). PSIs that involve patient harm indicate a failure in the handoff process in 80% of documented cases (Gogan et al.). Halm (2013) agreed with this assessment of failure, but only indicated 60% of the PSI cases sent to the Joint Commission were attributed to the

handoff process. Halm and Gogan et al. emphasized the importance of transferring accurate, timely information. The literature indicates that transitional periods require extra vigilance to minimize failures that occur because of carelessness.

Halm (2013) suggested that the patient hand-off should adhere to a minimal set of standards. These standards would limit reliance on individual practitioners to pass on enough relevant information. This sharing of information will aid in providing safe, continuous care. Halm went into more detail and stated that this communication should be clear, and include face-to-face conversation or the formal review of a checklist or other official documentation. This communication should include information related to potential changes in the patient's condition, rather than simply indicating that a routine was followed (Halm). If the caregiver is alerted in advance of possible changes in the patient's condition, the caregiver may respond quickly when the condition changes.

Non-technical skills. Non-technical skills are those that go beyond the training of medical care personnel. Non-technical skills, including communication and teamwork, may be responsible for preventable error (White, 2012). Communication breakdowns can lead to accidents, some of which result in death. In one case, several highly trained individuals were involved in some capacity and yet preventable errors occurred. Non-technical skills can help improve patient safety, but some barriers exist that may need to be overcome at the same time.

Among the barriers to incorporating non-technical skills into patient care are leadership, communication, and mutual performance monitoring (Andersen, Jensen, Lippert, & Ostergaard, 2010). These barriers affect the use of international guidelines for

resuscitation during cardiac arrest (Andersen et al.). Some organizations have incorporated simulation exercises (Bagnara, Parlangeli, & Tartaglia, 2010) or other means of enhanced situational awareness to overcome these barriers.

Nursing homes and small healthcare organizations. Nursing homes are less prominent in the literature than hospitals in terms of patient safety. In a geriatric nursing home setting, co-morbidity and a variety of concurrent medications can present opportunities for failure (Zúñiga, Schwappach, De Geest, & Schwendimann, 2012). Co-morbidity is also an issue in pediatric nursing homes (van Stralen, Calderon, Lewis, & Roberts, 2008). Higher risk patients will require additional mindfulness, and may increase the rate of PSIs experienced in the nursing home (Pryor, Hendrich, Henkel, Beckmann, & Tersigni, 2011).

Nursing homes have been the subject of government regulation since the enactment of the Omnibus Budget Regulation Act (OBRA) of 1987 (Colón-Emeric et al., 2010). Regulators collect data to determine payment amounts, and to assess and measure quality indicators within the facility (Colón-Emeric et al.). Regulators measure quality indicators using a quality assurance (QA) model (Edwards, 2013). Payment for services is contingent on meeting strict QA standards. These standards are based on individual performance rather than addressing organizational issues (Edwards). Accordingly, payments based on QA data may be doing more harm than good. Instead, a qualitative improvement (QI) model may be more effective. The QI model is better for addressing organizational or system problems.

Although regulation has improved patient safety in part, new problems were introduced. These problems include issues involving job satisfaction and subsequent attentiveness (Colón-Emeric et al., 2010). Healthcare organizations that admit higher risk patients may experience higher PSI rates, regardless of the quality of care provided (Bernal-Delgado et al., 2012). The relationship between patient condition and increased incidence of PSI has cast additional doubt on the effectiveness of regulated performance.

In contrast to the regulation-induced lack of mindfulness, High Reliability Organizations (HROs) enhance mindfulness and organizational awareness, which is attributed in part to the emphasis on obtaining information from those with the most information (Colón-Emeric et al., 2010). Enhanced mindfulness was determined to increase the rate at which medication and other errors were reported to regulating bodies (Colón-Emeric et al.). Encouraging mindful behavior can improve patient safety as new systems emerge and patient outcomes depend on the vigilance of care practitioners.

A healthcare organization serving critically ill patients may have some recourse when providing data to regulating authorities. Comparing expected mortality and observed mortality can help represent an improvement in the quality of care (Pryor, Hendrich, Henkel, Beckmann, & Tersigni, 2011). Alternatively, expected costs can be compared against actual costs (Pryor et al.). Comparing expected outcomes with actual outcomes can reduce organizational costs and can provide a starting point for better reimbursement models.

Other researchers also assessed the problem of equating outcome with reliability or quality (Pryor, Hendrich, Henkel, Beckmann, & Tersigni, 2011). A patient death or

safety incident may not tell the whole story (Bion, Abrusci, & Hibbert, 2010). Allowing for these complexities presents mixed results. Rather than relying on quality information based on outcomes, results are more applicable in the measurement of processes.

Patient illness in relation to outcomes. Some patients may have negative outcomes from deteriorating physical conditions rather than caregiver error, which skews PSIs and other safety measures (Naessens et al., 2012). These skewed PSIs could also occur through the increased opportunities for failure that coincides with increased time with the patient, or they may be influenced by the higher risk associated with chronically or severely ill patients. These increased risks can also increase the cost of treatments or follow-up procedures to correct any errors or adverse events. QI reporting is slowed by the extra attention required to meet the needs of these patients. This means that treating high-risk patients has the potential to drive up costs.

Business Applications for Patient Safety

As the rate of malpractice suits has increased, physicians are increasingly likely to engage in defensive medicine; a practice that may involve avoiding procedures to reduce the risk of liability in the case of an adverse outcome (Catino, 2009). Malpractice suits have caused insurance premiums to rise. These suits contribute to the increase in operational costs in healthcare organizations. These increased costs are approaching an annual rate of $38 billion (Debourgh & Prion, 2012). The cycle of patient error and increased insurance rates leads physicians to feel compelled to protect themselves, which subsequently feeds the cycle.

The fear of litigation may motivate some organizations to prevent safety incidents or avoidable harm. This fear contributes to a culture of blame, which adversely affects communication (Saleh, Marais, Bakolas, & Cowlagi, 2010). Open communication contributes to organizational learning, and is effective in preventing future occurrences (Saleh et al.). Developing a learning culture is more effective in preventing future incidents than developing a culture of blame. Reduced litigation costs are an added bonus to a culture free from blame.

Disruptive behaviors can also contribute to the likelihood of a PSI (Reiter III, Pichert, & Hickson, 2012). When physicians or supervisors intimidate care staff, communication breaks down. Studies have indicated a strong correlation between disruptive behavior and negative outcomes. Disruptive behavior should be discouraged, both to increase patient safety and to reduce organizational costs including turnover and litigation.

Psychological effects of error on staff. The staff of a healthcare organization is adversely affected when a patient is harmed. The adverse effects on staff include increased burnout, turnover, or other unwanted outcomes (O'Bierne, Sterling, Palacios-Derflingher, Hohman, & Zwicker, 2012). Care practitioners who harm a patient are affected in varying ways, depending on the severity of the harm. When patients have to deal with the harm for the remainder of their lives, the level of stress and anxiety in the practitioners is higher (O'Bierne et al.). When patients suffer for a shorter period, the level of stress and anxiety in the practitioners is lower. Knox and Simpson (2012) agreed that there are negative effects on the staff when an error occurs, and stated that the

preventable death of a patient is one of the hardest things from which a team may need to recover. A mistake or accident could be repeated multiple times before it is discovered. Repeated incidents of patient harm are particularly disruptive for the staff.

Organizational Culture

Patient safety culture. Patient safety climate and patient safety culture are frequently referenced in the literature. Some of the researchers in this area indicate that the two concepts are interchangeable, but most researchers seem to agree that patient safety climate and patient safety culture are independent concepts. Patient safety climate is understood as a business process, or the way things are (Weaver et al., 2013). Patient safety culture is the collective set of practices, beliefs, and goals of an organization and individuals who make up the organization (Weaver, et al.).

Organizations that promote safety culture actively seek information from their employees about potentially unsafe conditions (Waring & Bishop. 2010). Though organizations traditionally try to encourage this kind of sharing at an organizational level, there are advantages in looking to the social level instead. Effective team building involves trust, and knowing how one fits within the unit. This understanding of one's place within the organization is reinforced by the kinds of social interaction that occur behind the scenes daily. Though this type of social activity may be overlooked as simply gossip, relationship-building can help strengthen team interdependencies during both the normal work period and during a crisis. Encouraging employees to participate in social interaction may be beneficial in building a culture of safety.

Blame culture. Some organizational cultures dictate that a person responsible for an error should be punished. Among the barriers to improved patient safety is the blame culture inherent in medicine (Bion, Abrusci, & Hibbert, 2010). This culture is established among medical practitioners as early as their undergraduate studies (Liao, 2012). Implementing changes at the undergraduate level could have a positive effect on eliminating blame culture from healthcare.

Blame culture provides a significant barrier to organizational learning, and ultimately hinders efforts to improve patient safety. The fear of punishment, losing face, or other repercussions often leads to covering up mistakes rather than acknowledgement of mistakes (Moumtzoglou, 2010). Blame culture has influenced the development of new policies and regulations that do not address system problems (Goh, Chan, & Kuziemsky, 2013). Acknowledging mistakes helps team members learn from them and make better decisions (Moumtzoglou).

The blame problem is common in healthcare, and is partially responsible for repeated failure to report errors, which both masks the severity of patient safety issues and makes these errors more likely to be repeated (Moumtzoglou, 2010). The failure to report errors is driven not only by the fear of personal repercussions, but also repercussions that will befall a junior staff member or trainee in a supervisor's charge. The literature indicated that those under-reporting are not always making a selfish decision. Those under-reporting may fail to understand that future patients benefit from these incident reports.

Alhatmi (2011) described the need for removing blame from the organizational culture. The healthcare organization described by Alhatmi set up a confidential reporting system to improve organizational awareness of all incidents and to address these incidents properly. An organization takes responsibility for the actions of the individual by removing blame from the organizational culture. Taking responsibility at the organizational level leads to improved safety outcomes.

Blame culture is one of several factors that leave an organization open to error (Bion, Abrusci, & Hibbert, 2010). When frontline individuals are blamed for error, they may become reluctant to share information during future incidents, which further inhibits communication. This decreased communication can increase the risk of error.

Catino (2009) described an approach to investigating error, which readily assigns blame to an individual deemed responsible for the error. The public wants to be assured that errors are not repeated and that the individual responsible is punished. This desire to place blame may inadvertently increase the level of risk as individuals seek to shield themselves from this kind of negative attention (Catino). The public outcry for punishment leads to continued error because organizational learning suffers when an individual's fear of punishment outweighs his or her desire to prevent future occurrences.

Conceptual Framework

The conceptual framework for this study was based on High Reliability Organization (HRO) theory. This theory was selected for several reasons. HRO theory is an interdisciplinary theory that incorporates knowledge gained by studying high-risk industries where the rate of failure is very low (Sutcliffe, 2011). HRO was also the

foundational theory behind the cultural shift of the target organization in this explorative case study toward reliability (van Stralen, Calderon, Lewis, & Roberts, 2008). Incorporating this foundational theory into the conceptual framework contributed to an understanding of the study findings within the context.

High reliability organizations. HRO theory was developed primarily by a group of University of California, Berkeley researchers attempting to understand why high-risk organizations did not fail (Bourrier, 2011; Sutcliffe, 2011). The IOM report on patient safety in 1999 sparked the adoption of HRO theory among healthcare organizations (Bourrier). HRO theory has been largely academic, and there is ample opportunity for the development of practical application of theory beyond the current academic research.

HRO theory is structured around several basic principles that together promote a culture of safety. These structures include developing and maintaining standard processes; implementing checks and redundancy to mitigate potential failure; deferring to individuals with the most information; and developing teams that openly communicate about failure to prevent recurrence of unsafe incidents (Hartmann, Meterko, Zhao, Palmer, & Berlowitz, 2013). An organization that is reliability-seeking is preoccupied with failure and actively works toward building and enhancing a culture of safety (Shabot, Monroe, Inurria, Garbade, & France, 2013; Bigley & Roberts, 2001; Roberts & Bea, 2001; Weick, Sutcliffe, & Obstfeld, 1999).

Some researchers questioned if an organization could become a High-Reliability Organization. Sutcliffe (2011) stated that organizations may be reliability-seeking, but cannot reach the status of HRO. Seeking reliability is an ongoing process. Reliability-

seeking organizations simultaneously seek to prevent error, and mitigate errors that occur (Sutcliffe). The organization may distribute lessons learned from the error throughout the organization.

Casler's (2013) description of NASA is similar to that of Sutcliffe (2011) regarding its status as an HRO, but Casler focused on individual components of NASA rather than the entire organization. While NASA remains very interested in safety, there are multiple outside agencies influencing decision-making within NASA, and the organization may be too large to respond quickly when conditions deteriorate. Casler considered HRO suitable for smaller organizations, and suggested that smaller components of NASA are reliability-seeking. NASA serves as a representative sample of the challenging task of achieving HRO standing, particularly in a large organization.

Interdisciplinary. Much of the early HRO literature originated from within the firefighting industry. Safety concerns grew after several unnecessary deaths occurred during two major wild-land fires (Weick, 1996). These firefighters, whether because of training or other reasons, failed to drop their tools and run for safety. Individuals in other industries have also failed to drop their tools, though these tools may take the form of processes or procedures rather than physical tools. Change is challenging, even when it is critical for survival.

The nuclear power industry has the potential for catastrophic disaster that can cause far-reaching harm. From 1991 until the 2011 incident in Japan, no major safety incidents occurred at a nuclear power plant (Hudson et al., 2012). Among the factors for this success is a preoccupation with failure that drives cooperation among peer groups

who regularly engage in non-regulatory peer-review (Hudson et al.). Organizational risks and mistakes are exposed to the greater community to improve organizational learning. The safety culture within these facilities is designed to encourage cooperation rather than elicit fear of failure. The absence of regulatory oversight in this process may contribute to the open communication with peer groups to increase industry safety on a global scale.

Incident command system. The Incident Command System (ICS) is a type of organizational structure compatible with HRO theory. The ICS is a hybrid that benefits from bureaucratic strengths but adapts as needed when conditions change – one of the characteristic strengths of an HRO (Bigley & Roberts, 2001). The ICS can quickly change its structure multiple times, with each member adapting to prescribed roles for each structure (Bigley & Roberts). This combination of rigid structure, with the ability to remain flexible, is useful in many types of disaster management systems. Acts of terrorism, public safety crises, weather events, and other disasters can benefit from ICS (Bigley & Roberts). An ICS may contribute to increased safety alone, but it is compatible with, and can be better described as, an HRO process.

Bureaucratic systems. Bureaucratic systems tend to break down as conditions change, or unknown variables come into play. Although useful in providing needed structure, this type of system also hinders the organization by limiting the type of flexibility needed to adapt to changing conditions (Bigley & Roberts, 2001). Changing the structure of an organization to provide needed flexibility to avoid catastrophes can be challenging, but some organizations have succeeded.

Scholars began leaning toward flexible systems as early as 2001 (Roberts & Bea, 2001). Some compared the flexibility of these new systems as the shape-shifting form of an ameba (Roberts & Bea). Agile, flexible structures are beginning to take prevalence over rigid bureaucratic systems. Sutcliffe (2011) referred to this flexibility as a component of resilience. The organization flexes in response to change and continues moving toward a stronger safety culture (Sutcliffe). Boin and van Eeten (2013) described resilience as the ability to bounce back quickly when something adverse occurs. Resilience is a concept difficult to grasp, because it is seen in practice, yet it is hard to prove in theory. Boin and Eeten also suggested that resilience is only visible in hindsight, when it has already occurred.

Reliability and efficiency. The concepts of reliability and efficiency appear to be counterproductive. The structures that enable efficiency can be the cause of failure, or lack of reliability (Roberts & Bea, 2001). A reliable organization is focused on detail, system interoperability, and vigilance, which are counter to the goal of time-saving and cost-saving efficiency (Roberts & Bea). It takes time to be vigilant and mindful of processes.

In a group setting, members of HROs have developed the capacity to process information (Roberts & Bea, 2001). The actions of the group are geared toward a sense of contribution to organizational goals. This sense of contribution is similar to the ICS described by Bigley and Roberts (2001), because each part of the team is focused on tasks that contribute to the larger goal. Reliability-seeking teams also resist simplification

of processes, which can detract from mindfulness (Minei & Bisel, 2012). Sacrificing efficiency may be necessary to increase safety.

Adaptive learning and reliability. Adaptive learning and reliability are not mutually exclusive. One feature of a reliability-seeking organization is the ability to embrace adaptive learning while remaining highly reliable (Weick, Sutcliffe, & Obstfeld, 1999). This adaptive learning is enhanced by an organizational or collective mindfulness. Sutcliffe (2011) described this adaptive learning as a component of resiliency, or the capability to recover from errors. Incorporating institutional knowledge with adaptive learning can help reduce error by enabling decision makers to make decisions that meet the need, rather than trying to fit in with policies or procedural norms.

Organizational learning. Smaller healthcare organizations and nursing homes may have challenges in increasing institutional knowledge. Night shift workers, including maintenance staff and patient care staff are not always aware of changes implemented by administrators (Zúñiga, Schwappach, De Geest, & Schwendimann, 2012). They may also be overlooked when administrators are seeking feedback on safety issues or concerns. Each member of the organization can contribute to organizational safety climate. Management personnel should ensure employees are empowered to alert the team to unsafe situations.

Collective mindfulness. Organizational learning can influence the smooth operation of an organization, yet new data is needed to help fill gaps in organizational knowledge. HRO enables adaptive learning and reliability simultaneously (Weick,

Sutcliffe, & Obstfeld, 1999). The lessons learned through this decision-making process add to the organizational body of knowledge, and aid in ongoing organizational learning.

Mindfulness is a concept that adapts to fit within its own context. For the purposes of this study, mindfulness should be understood in the context of HRO theory and patient safety. Mindfulness is the ability to remember and focus on the current moment (Dane, 2011). Mindfulness enhances focus to ensure information flow is not diluted with unimportant or extraneous details. In a medical emergency, this kind of mindfulness can help keep a physician or other caregiver focused on the situation at hand.

Authority migration is one way reliability-seeking organizations remain flexible in a crisis. The migration of authority does not require discarding the organization chart, but provides the opportunity for those with the most information to be granted the authority to make decisions in a crisis (Bigley & Roberts, 2001). Accordingly, higher-ranking team members can easily defer to lower-ranked counterparts to make sure proper resources are allocated to the current task.

Though the top-down approach to safety may seem the most effective, the frontline employee's view of safety culture is often more effective in addressing patient safety. Some consider frontline employees' evaluations of unsafe conditions as better predictors of patient outcomes (Singer, Lin, Falwell, Gaba, & Baker, 2009). This consideration is consistent with HRO theory, in which it is recommended that the person with the most information should be allowed to make critical decisions.

An organization with a strong safety climate empowers employees to make decisions (Singer, Lin, Falwell, Gaba, & Baker, 2009), particularly from the front line.

This empowerment provides freedom to make informed decisions that positively affect safety, without regard to interference in business processes that ordinarily provide tension. The freedom to make decisions encourages organizational learning and enhances institutional knowledge.

Through daily execution of their duties, frontline team members gain experience in the nuances of their job. This experience enables them to identify an extraordinary event as it unfolds (Mauelshagen, Denyer, Carter, & Pollard, 2013). The ability to identify these events can be seen when a firefighter recognizes an abnormal condition (Mauelshagen et al.) or an experienced caregiver recognizes a deteriorating medical condition (van Stralen, 2008). Allowing these experienced individuals to make critical decisions from the bottom-up is a feature of a reliability-seeking organization (Mauelshagen et al.; Minei & Bisel, 2012). Senior organizational leaders receive and act upon any alerts in a reliability-seeking organization.

Authority migration does not contribute to a culture of rule breaking or freelancing, because individuals are content to follow procedure when the risks are minimal (Mauelshagen, Denyer, Carter, & Pollard, 2013). When extraordinary or emergent situations arise the supervisor is informed of the issue, and a plan of action put into motion. This knowledge may be extended into adaptations of organizational policies, which enhances organizational awareness and mindfulness.

HRO Applied in Healthcare

The examples provided by the aviation, nuclear power, military, and public safety industries indicate that it is possible to translate HRO theory into healthcare (Hartmann,

Meterko, Zhao, Palmer, & Berlowitz, 2013). Healthcare is somewhat unique compared to these other industries, however. In healthcare, adverse events can happen frequently and may affect a single patient rather than a large group (Bagnara, Parlangeli, & Tartaglia, 2010). The organization needs to be structured in such a way as to support various safety processes, and safety must be an organizational goal (Hartmann et al.). In contrasting organizational culture and safety climate, Hartmann et al. described culture as a set of values that guide individual behaviors, while climate is more involved in organizational behaviors and goals.

Implementation of HRO theory in healthcare is rising. Thomassen et al. (2011) indicated that a checklist approach would be useful in reducing risk where it is present every day. Other researchers provided a narrative approach that documented the implementation of HRO theory in two facilities (van Stralen, 2008). Some researchers focused on training methods. The manner in which the theory helps staff deal with risks daily should be addressed in a reliability-seeking organization (Gardner, Yun, 2010). Though these studies offer insight into the various aspects of HRO in a business or healthcare setting, the researchers do not adequately address the needs of a firm interested in creating a new business unit or organization.

Addressing blame culture through HRO theory. Blame culture describes the tendency to find an individual or group to blame when something goes wrong. Assigning blame is a natural organizational tendency, especially among those organizations designed by engineers (Roberts & Bea, 2001). By looking too closely at the individual,

systemic problems in the organizations may be overlooked. The system may be the larger problem, and the individual might avoid failure with a different system design.

Physicians experience increased exposure to risk while practicing medicine. The scrutiny of physicians by regulatory bodies and the public created a situation where the physician often acts in self-defense, rather than in the best interests of the patient (McGivern & Fischer, 2010). This defensive decision process may include sending patients to the hospital rather than risk the exposure if something goes wrong under their care. The trend toward defensive practice contributed both to the persistence of blame culture and to the unwillingness of leaders to address patient safety. Researchers determined that the presence of blame culture correlates with higher numbers of PSIs (Singer, Lin, Falwell, Gaba, & Baker, 2009).

Blame culture is an international issue. Greek nurses evaluated blame culture and observed similar effects as those seen elsewhere (Moumtzoglou, 2010). Nurses are positioned to reduce safety issues, yet remain silent where blame culture is prevalent. Communication is critical in matters of patient safety. Organizations are positioned to make good decisions when the staff is encouraged to speak up and to add to organizational knowledge of safe or unsafe procedures (van Stralen, Calderon, Lewis, & Roberts, 2008). International health care organizations need to address blame culture to increase critical communication among staff to improve patient safety.

Human factors. Human error is increasingly recognized as one reason systems fail (Norris, Currie, & Lecko, 2012). The concept of human factors was introduced in the healthcare industry by Al Chapanis in the 1950s to address patient safety concerns

(Carayon, 2010). The concept gained traction in recent years. A system designed to allow for fatigue, stress, and other issues that negatively influence performance may be better equipped to succeed. An organization may plan for mistakes once leaders acknowledge that the staff will make mistakes. This planning may include building system responses to mitigate the effect these mistakes have on the patients and the organization.

Fatigue is often considered acceptable in healthcare, and is a regular part of the early training of physicians in medical school. The serious physical effects of fatigue were addressed in aviation and other industries, but were addressed later in healthcare (Gaba & Howard, 2002). Medical doctors and patient care staff are commonly subjected to long shifts, and subsequently make mistakes. Gaba and Howard compared sleep deprivation to alcohol consumption. This comparison indicated sleep deprivation can lead to far greater impairment of the senses than alcohol. Sleep deprivation can be dangerous in any industry, including healthcare.

Though organizations in other industries have addressed human factors as related to safety, the concept of human factors is relatively new in healthcare. Lessons learned in these other industries can contribute to improved patient safety in healthcare, because there are related issues across multiple industries (Norris, Currie, & Lecko, 2012). Environmental factors include noise or other disruptions (Diller et al., 2013). Alarms should only sound when needed to prevent staff from tuning them out (Norris, Currie, & Lecko). Another solution includes changing culture to encourage staff to communicate. This call for open communication is consistent with other HRO research because blame culture can contribute negatively to patient safety outcomes.

Checklists may be useful in reducing medical error (Thomassen et al., 2011). The views of Thomassen et al. are consistent with Norris, Currie, and Lecko (2012), who said that other industries that allow for human factors for error can offer insight into healthcare. Aviation, specifically, is a good source of information on the successful implementation of checklists to improve safety (Clark et al., 2012). Thomassen et al. stressed that checklists are a tool to improve quality improvement, and not the end goal. Clark et al. agreed with this idea of using a checklist, and added that the people responsible for using the checklist should have insight into the implementation and evaluation of the checklist. Tools used in medical procedures can improve safety, though tools are still subject to human error.

Mindfulness and situational awareness. Situational awareness has become increasingly popular in modern organizational theory. Situational awareness manifests in HRO theory in the form of the OODA Loop, which was developed by retired Air Force Colonel John Boyd (Enck, 2012). OODA is an acronym for Observe, Orient, Decide, and Act. The OODA Loop was developed to enhance the safety of fighter pilots during aerial combat. The value of the OODA Loop is not limited to those engaging in aerial combat. There are also business applications for the OODA Loop (Mattox, 2012).

Frequently performed tasks can put a practitioner into autopilot, providing the opportunity for error (Mattox, 2012). Similarly, paying too much attention can provide an opportunity for error. As incidents begin to escalate, mindfulness and attention to detail can increase the likelihood that the error is caught and addressed before it gets out of control (Dane, 2013). Simple measures may be taken to increase safety; including

reducing distractions such as needless alarms, so the practitioner does not learn to tune out the noise.

Reflective practice. Reflective practice may seem counterintuitive in healthcare, but it may be useful in improving patient care. Reflective practice is a way of thinking about a current problem, looking at it from different angles, and determining how best to respond (Jordan, 2010). Looking at a problem from different angles leads to a higher sense of awareness of what is going on in the moment, and does not rely exclusively on past results. This concept is consistent with the OODA Loop (Enck, 2012; van Stralen, 2008).

Staff may become complacent when the process of providing patient care is routine. Experienced staff may be reluctant to respond appropriately to an emergent situation (Jordan, 2010). Rather than relying on prior outcomes, the uniqueness of the current situation can trigger a resilient response and the situation can be addressed based on the details at hand.

High-reliability teams. Establishing high-reliability teams may enhance situational awareness, improve communication, and create a shared culture free from blame (Riley, Davis, Miller, & McCullough, 2010). Each member of the team brings important information to the organization. Individual team members bring varying levels of education and experience to the team (Wilson, Redman, Talsma, & Aebersold, 2012). Team members with similar job descriptions also see this variance (Wilson et al.). When each team member contributes information to the group, the whole picture may be understood, leading to accurate and prompt decisions (Riley et al.).

Communication and teamwork can improve safety at times when safety ordinarily might be compromised (Riley, Davis, Miller, & McCullough, 2010). Though individuals are highly trained, a group of highly trained individuals does not make a team. Highly reliable teams require individual team members to practice situational awareness and to communicate openly, and often, with teammates. Awareness and open communication reduce under-responding or over-responding to orders in a crisis. Checklists can contribute to the situational awareness and open communication that Riley et al. described (Clark et al., 2012).

Interdepartmental teams may not always realize the effect they have on other departmental practices. Interdepartmental sharing may enable team members to understand their respective roles within the organization (Hernantes, et al., 2013). Sharing information between departments may also help delineate the relationships of the respective team processes . A nurse may help solve a respiratory therapist's problem by providing additional insight into the patient's condition (van Stralen, Calderon, Lewis, & Roberts, 2008).

Mindfulness is enhanced when an individual is focused on others. Vogus, Rothman, Sutcliffe, and Weick (2014) described an orientation toward others which contributes to a faster response to unsafe conditions. The individual is more aware of things going on externally when focused on others. This focus makes it easier for the individual to determine if a problem is occurring and which individual may be best suited to address the problem (Vogus et al.). A team that is others focused is prepared to respond to unexpected change.

High-risk, critically ill patients can present a significant challenge to healthcare providers. Conditions may deteriorate quickly, and often there is not an easy solution to the problem (van Stralen, 2008). With a high degree of risk, and regardless of the decision made, resilience and teamwork enable care staff to respond safely to these emergencies. Teams can make necessary changes to meet changing conditions in an environment where blame is removed, and trust is established.

Effective teamwork plays an increasing role in the improvement of patient safety. Work performance levels and staff well-being are affected positively by working in effective teams (Manser, 2009). Teamwork positively affects the rate of PSIs. Open lines of communication reduce delays during procedures. Working toward a common goal further improves productivity. Teamwork, improved communication, and a reduction in delays appear to be effective at reducing PSIs.

Criticisms of HRO Theory

Critics of HRO theory cite a lack of relevance for smaller organizations (Roberts & Bea, 2001). To answer this criticism, Roberts and Bea focused on specific maritime case studies that involved smaller organizations. The case studies they examined include the tragedies surrounding the *Titanic*, *The Herald of Free Enterprise*, and *The Estonia*, all of which involved avoidable loss of life. These case studies illustrated systemic failures, though individuals were blamed for specific contributions to the disasters.

Critics have also called into question the concepts of safety versus reliability in HRO theory. Leveson, Dulac, Marais, and Carroll (2009) argued that it is possible to be reliably unsafe, and to be safely unreliable. Shrivastava, Sonpar, & Pazzaglia (2009)

echoed this concept. Shrivastava et al. suggested that early HRO theorists should have substituted the word *safety* for *reliability*, which might be a more apt description.

Other criticisms of HRO theory concerned the data collection methods. Many HRO researchers collected ethnographic data, which led critics to question their objectivity (Bourrier, 2011). This critique parallels the debate regarding quantitative and qualitative research methods. Though used in criticism, acknowledgement of the ethnographic nature of early HRO research led to additional ethnographic research on high risk organizations.

Alternative Theories

Normal accident theory. Normal Accident Theory (NAT) suggests that accidents are unavoidable. No matter how much regulation is pushed upon an organization, parties on both sides are willing to overlook the regulations and an accident will result (Perrow, 2011). Accidents are the result of complex systems, which may occur in any number of combinations of events, ultimately causing even the best plans to fail. Much of the research on HRO theory was designed to mitigate the risks that Perrow considered inevitable.

In the Fukushima disaster, bureaucratic issues made the correction of errors problematic (‘t Hart, 2013). This bureaucracy led in part to the series of errors that followed in the wake of the earthquake and tsunami. The system was complex, and there was little room for error (Quigley, 2013), which are seen as precursors to a normal accident. The number of ways a cooling system could fail indicates that the incident is in line with Perrow’s (2011) concept of a normal accident (‘t Hart).

Silvast and Kelman (2013) reviewed NAT to determine whether it could be disproven. Shrivastava, Sonpar, and Pazzaglia (2009) agreed that disproving NAT is challenging, but also questioned the falsifiability of HRO theory. The potential for normal accidents is often unknown until after the accident occurs (Silvast & Kelman). An absence of failure does not indicate that failure will never occur, which suggests NAT is always a possibility. Tight coupling and critical systems will result eventually in failure, or a normal accident (Silvast & Kelman). Casler (2013) made a similar point, and added that presuming one can anticipate every disaster would be disastrous.

In the 1990s, HRO and NAT were pitted against each other as opposing concepts (Bourrier, 2011). Later researchers tried to connect the two groups, though Perrow did not agree that HRO could be considered the next step in NAT. Perrow cited in partial explanation the methodology differences between the theories (Bourrier). Silvast and Kelman (2013) continued the argument. They asserted that the claims of HRO theorists that accidents were prevented, and are preventable, simply have yet to experience the impending normal accident that remains inevitable. Sutcliffe (2011) presented a similar argument, but argued in favor of HRO. Shrivastava, Sonpar, and Pazzaglia (2009) added that while the two theories are considered to be leading in their field, the proponents have found it challenging to determine whether the two are complementary or in opposition. The lines serving as a boundary between HRO and NAT continue to present a moving target, dependent largely on the individual researchers.

While the proponents of HRO theory and NAT have debated the various issues, other researchers have called both theories into question. From an engineering viewpoint,

the generalization of certain industries that are considered tightly coupled is incorrect (Leveson, Dulac, Marais, & Carroll, 2009). Generalization may be misleading because there are tightly coupled and loosely coupled components within the same system Leveson et al. disagreed with Weick, Sutcliffe, and Obstfeld (1999) about the frontline employees having the necessary judgment to lead in a crisis. Leveson et al. also called into question Perrow's (2011) thoughts on redundancies, because Perrow did not cover all means of reducing complexities. HRO theory and NAT were not dismissed outright by Leveson et al., but they called for reevaluation of the causes of failure, and the means of preventing future error.

Six Sigma. The Six Sigma methodology is designed to reduce waste and increase efficiency (Amato-Vealy, Fountain, & Coppola, 2012). A five step process includes problem identification and root cause analysis, and implementation of proposed changes. As with HRO, Six Sigma gleans valuable insight from frontline employees.

Six Sigma and HRO are not mutually exclusive. Six Sigma represents one of a number of different management styles designed to address QI issues (Murphree, Vath, & Daigle, 2011). Like HRO, Six Sigma was adapted in response to the payment-for-QI-performance structure imposed by regulators. Lean Six Sigma has been implemented in healthcare to address specific patient safety issues, but the effects of the implementation fade over time. These effects may be sustainable if the closing process in Six Sigma is refocused as a control process (Murphree, Vath, & Daigle). This control process complements the OODA Loop process in HRO (Enck, 2012), and the concept of situational awareness. The cycle should repeat continually to address new issues.

Next Steps in Patient Safety

Education and training. Organizations do not effectively train staff in the manner in which HRO theory helps staff deal with risk daily (Gardner & Yun, 2010). This training should be improved in an organization seeking reliability. A reliability-seeking organization should be mindful that new employees will come to the organization with a unique view of organizational culture. HRO theory should be trained to new employees to reduce the learning curve and open lines of communication as early as possible.

Incoming care practitioners should be trained in handoff procedures, and existing staff should be trained at regular intervals (Halm, 2013). This training will emphasize the importance of providing safe, reliable care. Pocket cheat sheets or other educational supplements could also be effective in reminding staff of safe procedures (Halm). This type of continuous training is in agreement with Gardner and Yun (2010), specifically regarding the training of new staff that is unfamiliar with HRO.

All employees should be trained on patient safety. Employees do not need to have direct contact with the patient to participate in patient safety initiatives (Shabot, Monroe, Inurria, Garbade, & France, 2013). Shabot et al. described a continuing education process, where employees are consistently reminded about the organizational commitment to patient safety. This continuing education is consistent with HRO theory, where repetition is encouraged (Braun et al., 2013). Shabot et al. also described a reward system to encourage safe practices. Consistent training and reward systems may help keep employees engaged in the patient safety process.

Simulation. Simulation is useful in improving patient safety. Some organizations have used *in situ* simulation in an effort to move toward becoming an HRO (Riley, Davis, Miller, & McCullough, 2010). Teams created with a common purpose and running realistic simulations can identify training needs that have not been addressed. Simulations also build up the practitioner's confidence in their decisions (van Stralen, Calderon, Lewis, & Roberts, 2008). Increasing the confidence of nursing and respiratory staff through simulation can help reduce errors in the field, and improve patient safety.

Simulations provide opportunities for interdepartmental training, and allow specialized personnel to build skills as a reliable team member (Riley, Davis, Miller, & McCullough, 2010). Medical training is primarily focused on improving the individual, rather than training the individual to be an effective team member. For teams to achieve reliability, each specialized member must contribute their unique skills, as appropriate, while being mindful of the larger view and where they fit within the process.

Simulation is valued because it provides real-world experience in a controlled, safe setting (van Schaik, Plant, Diane, Tsang, & O'Sullivan, 2011). To improve teamwork, multiple disciplines must be represented in the simulation; including physicians, nurses, and respiratory staff. Incorporating multiple disciplines helps to suspend disbelief when working with a simulated patient. Simulation also empowers interdisciplinary team members to speak up when an unsafe incident occurs, which further enhances the culture of safety within the organization (Argani, Eichelberger, Deering, & Satin, 2012).

Simulation is not a turnkey process. Organizations that choose to implement simulation need to develop a program and define an audience before buying equipment (Argani, Eichelberger, Deering, & Satin, 2012). Planning will enhance the organizational value of the simulations. The desired outcome of the simulation should be determined early on, to maximize the value of a simulation exercise. Proper planning can prevent the reinforcement of inappropriate actions or behaviors and encourage improved communication and mitigate risk.

Research Methods

Explorative single case study design. The increase in complexity in health services organizations promoted a resurgence of the case study method in research (Yin, 1999). Yin argued that this resurgence in healthcare case studies came after a period of decline, but were once popular. Earlier studies incorporated document review, field notes, and interviews, which are still useful in modern case studies. Amerson (2011) added that case studies may also incorporate archival records, observation, and physical artifacts. Yin pointed out that recent case study research in healthcare did not build on prior work as is typical in academic research. The neglect of prior research was something Yin hoped to correct. A case study design may include a single case or multiple cases (Singh, 2014).

***Strengths and weaknesses*.** One of the strengths of a case study is the examination of a phenomenon within its context, rather than in a controlled environment (Amerson, 2011; Yin & Davis, 2007; Yin, 1999). One of the primary weaknesses is the perceived inability to generalize the research (Yin). Gibbert and Ruigrok (2010) agreed

that rigor is considered a weakness in the case study design. Amerson made a similar statement when looking at research design in the field of nursing. Yin responded to this criticism by comparing a single case study with a single empirical study, and comparing the case studies in aggregate the way empirical experiments are currently conducted. Amerson supported this approach. Similarly, Gibbert and Ruigrok suggested that comparing cases with additional internal or external cases may further contribute to generalization of the findings.

The case study has also proven to be challenging because of varied descriptions about what case studies are (Amerson, 2011). Yin (2009) made a similar assessment, and added that case studies were historically treated as components of another method rather than a separate and distinct method. Case studies have been used as a teaching method with a specific conclusion expected, which is contrary to an unbiased case study research design (Amerson). An explorative case study design should incorporate specific definitions as to what the case means within the context of the study (Yin, 1999).

Sample size. Quantitative and qualitative methods differ in the determination of sample sizes. Bernard (2013) stated that qualitative studies usually have small sample sizes. O'Reilly and Parker (2013) made similar comments, and added that in qualitative research the sample size should be sufficient to answer the research question. If saturation is not reached, additional participants should be added until no new ideas or concepts come from the data. A small sample size in a qualitative study does not diminish the validity of the study.

Rubin and Rubin (2012) stated that the quality of the sample is more important than the size of the sample. The sample quality described by Rubin and Rubin relates to the sample size described by Bernard (2013) and O'Reilly and Parker (2013). A sample that includes two to three participants from each area of interest should be sufficient in an explorative case study (Rubin & Rubin). A small group of participants knowledgeable about the case are sufficient to provide data with depth and quality.

The sample size is also determined by saturation (Hodges, 2011). Francis et al. (2010) developed a method for measuring saturation. Interviews should continue until three interviews in succession fail to provide new information (Francis et al.), known as the 10+3 rule. The number 10 in the rule is the starting point for the number of participants, and may be higher or lower depending on the availability of participants. If saturation is reached before the estimated minimum number of participants have been interviewed, it does not affect the validity of the study. Interviewing additional participants beyond the point of saturation will not likely add new information to a study.

***Validity*.** While quantitative data allows for the removal of outliers, in qualitative case studies a researcher should incorporate outlying cases to ensure the audience understands that all data were considered in the analysis (Gibbert & Ruigrok, 2010). Additionally, Yin (2009) stated that internal validity is of concern specifically in a case study, where causal relationships are described. For this reason, inference should be tempered with a thorough review of rival explanations (Yin). By ensuring that all the data has been included, and rival explanations accounted for, the internal validity of a qualitative study was enhanced.

Gibbert and Ruigrok (2010) suggested that the context should be adequately described to provide future researchers a better guide in selecting subsequent cases. This concept of context is in agreement with Yin (2012), who added that context is useful in determining how to generalize the data for use in other organizations. Yin also stated that the concept of statistical generalization in quantitative research and sampling is different from the analytical generalization of qualitative data. Qualitative data should be generalizable toward a theoretical construct rather than toward other organizations.

Qualitative health care research. Quantitative research has been the dominant method in medical and health care research, though qualitative methods are gaining acceptance (Wuest, 2011). Morse (2011) made a similar statement and added that while qualitative health research is gaining ground, quantitative data is still largely seen as more appropriate in health care. Devers (2011) said that qualitative research contributes equally to the knowledge base of a field, and noted that qualitative studies were cited at comparable rates as quantitative studies. Quantitative studies generally have more funding, and journal editors may limit the volume of qualitative articles (Weiner, Amick, Lund, Lee, & Hoff, 2011). Page restrictions and other limitations may prevent qualitative researchers from publishing complete information, which further limits the perceived value of qualitative research. As qualitative research has regained ground in healthcare research, it has potentially been limited by other means.

Qualitative health research is used in nursing homes and smaller health organizations and has spread throughout the medical care industry (Morse, 2011). Qualitative research can be used to evaluate the culture in a healthcare organization. It

can also be used to address changes quickly in the rapidly evolving healthcare field, by providing contextual information about current practices (Weiner, Amick, Lund, Lee, & Hoff, 2011).

Transition and Summary

The literature indicated that preventable medical harm is a persistent problem, despite efforts by regulatory bodies and healthcare organizations to improve safety. Patient safety incidents may harm the patient physically, and may harm the organization in terms of higher costs, insurance rates, and operational expenses. Patient safety is a well-established research subject, yet the rate of error has not significantly improved.

The problem and purpose statements for this qualitative, explorative single case study supported the exploration of the affect the perceptions and experiences of nursing and respiratory staff had in the transition toward reliability to improve safety. HRO theory was identified as the conceptual framework for this study. Section 2 presents the research design and method for this qualitative, explorative single case study. Section 3 presents the study findings and related recommendations.

Section 2: The Project

Preventable medical errors present an increasing risk to a healthcare organization, even as the quality of healthcare continues to advance (Dickson & Flynn, 2012). An estimated 40,000-98,000 patients died in 1999 from preventable medical errors (Chassin & Loeb, 2013), and updated estimates from 2011 indicated the number of errors could be 10 times higher (Andel, Davidow, Hollander, & Moreno, 2012). High Reliability Organization (HRO) theory offers a potential solution to reduce this risk. Reliability-seeking organizations operate in an area of high risk but have unusually low rates of failure (Roberts, 1990). Though some studies describe HRO theory implementations in healthcare settings, there are relatively few studies that examine HRO implementations in sub-acute nursing facilities, acute care hospitals, or other smaller healthcare organizations. Patient safety culture as seen through the eyes of practitioners might contribute to both a business and a social change, because the improvement of patient safety will directly improve the lives of those affected by the change.

This section describes the case study used in the research project. It includes additional levels of detail on the research design and method used, and the data collection and data analysis plan. The study was initiated upon approval by the Walden University Institutional Research Board (IRB) and the University Research Review (URR) committee and data was collected in October, 2013. The results, findings, and related recommendations are documented in Section 3.

Purpose Statement

This qualitative, explorative single case study explored how the perceptions and experiences of nursing and respiratory staff affected the successful transition of a healthcare organization into a reliability-seeking organization. It obtained data through observations of nursing and respiratory staff interactions and through semi-structured interviews with individual nursing and respiratory staff. All nursing and respiratory staff at the research site were eligible for observation, which took place in group settings during the course of their work shifts. These interviews and observations were used to explore how organizational culture influences safe patient care.

Role of the Researcher

A researcher may encounter unexpected responses based on the role a participant assigns to the researcher (Rubin & Rubin, 2012). Delineating a proper role early on is prudent, and encourages open communication. Some researchers choose to present themselves as students, professors, or authors, to be viewed in a specific light. Others connect based on a shared interest with the participants.

I share an interest with the nursing and respiratory staff in the well-being of the resident patients, which helped to establish relationships with the participants. Through prior employment with the organization, some of the participants were already familiar with me. Rather than depend on familiarity, a new role was emphasized - a role as a student with much to learn from the collective experience of the staff.

Participants

Fourteen participants were purposefully selected from a sub-acute nursing facility that serves high-risk, technology-dependent children in the western United States. The participants were selected from the 280 employees located in the flagship facility at the research site. Purposeful sampling is used to identify participants who are likely to provide useful data to answer a research question (Beadle, 2013; Abrams, 2010). Criterion sampling is useful for enhancing the quality of the data (Marshall & Rossman, 2011). Criterion samples are used in purposeful sampling to select participants who meet specific criteria (West, 2013). Rubin and Rubin (2012) suggested a minimum of two or three participants should be selected per group of interest, from a single department or throughout an organization. I selected participants from nursing and respiratory care specialties who were employed at the research site and were not managers during the organizational transition toward reliability. Organizational leaders granted permission to contact potential participants to conduct interviews (Appendix A).

I obtained permission from the Walden University Institutional Research Board to conduct interviews for this study. The Institutional Research Board (IRB) approval number for this study is 10-03-13-0313263. I contacted supervisors from the nursing and respiratory care departments by phone and email, and sought assistance in finding participants that met the criteria for selection. A copy of the consent form was emailed to organizational supervisors to provide criteria for inclusion in the purposeful sample (Appendix B). The consent form and letter granting permission to conduct research (Appendix A) were posted throughout the facility. The nursing and respiratory managers

invited me to introduce my study during regularly scheduled meetings at the start of the day and night shifts. To maintain confidentiality, participants were not allowed to volunteer during the meetings in front of their peers. They were instructed to contact me in person, by phone, or email.

Some of the participants knew me through my prior employment with the organization, and we had already established a working relationship. This created an atmosphere in which participants were immediately comfortable in sharing information with me. This was an important factor because participant comfort strengthens the results of a study (Rubin & Rubin, 2012). These established relationships also provided a starting point in gaining credibility and acceptance among the remainder of the staff.

Participants were assured of their confidentiality, and the process for maintaining confidentiality was outlined in the consent form each participant signed as a condition of participation (Appendix B). All participants were informed of their role in the project, and were assured that managers or administrators at the facility will not use their comments against them. Participants were also informed that data will be retained for five years, and then all digital and physical copies will be destroyed. The consent form was distributed to participants at the time of the interview. Participants were required to sign the consent form prior to commencement of their respective interviews.

Research Method and Design

The selection of a research method directly affects the data collection and analysis processes required to complete the study (Yin, 2012). The research method is also affected by the research question (Yin). This study was conducted using the qualitative

method. An explorative, single case study design was used to answer the research question: How did the perceptions and experiences of nursing and respiratory staff affect the successful transition of a healthcare organization into a reliability-seeking organization?

Research Method

I selected the qualitative method to answer the research questions in this study from within the context of the organizational transition toward reliability. Qualitative research is useful in placing a researcher within the context of the subject being researched, which provides a unique perspective on the gathered data (Denzin & Lincoln, 2011). The qualitative method includes field research and is used to explain and describe meanings that particular individuals or groups give to a specific point of reference (Watkins, 2012).

Quantitative data were not required for this study. Quantitative data are useful when a researcher is interested in cause and effect, and to determine relationships between variables (Watkins, 2012). Sample sizes are usually large, and are used to represent a larger population. Staff from the target organization already used quantitative data to determine that the organizational safety culture changed and patient safety improved (van Stralen, Calderon, Lewis, & Roberts, 2008). The mixed method approach was also not appropriate for this study because quantitative data were not required. This study explored how the perceptions and experiences of nursing and respiratory staff affected the organizational transition toward reliability, which is consistent with a qualitative research method.

Research Design

An explorative single case study design supported the exploration of the effect nursing and respiratory staff perceptions and experiences had on the successful transition of a traditional subacute nursing facility to a reliability-seeking organization. A case study may be used to answer an exploratory question, and is used to determine how or why something happened (Yin, 2012). A case study may also be used to confirm existing theory. The use of HRO theory during the organizational transition toward reliability and as the conceptual framework in this study is supported by the use of a case study design to confirm existing theory (Houghton, Casey, Shaw, & Murphy, 2013). The case study method can also be used as a teaching tool, to show other organizations a possible result of engaging in similar practices (Marshall & Rossman, 2011). This study may be used as a teaching tool for other organizations looking to reduce the number of preventable medical errors through the application of HRO theory.

Alternative qualitative designs would not have sufficiently contributed the rich exploration of the case examined in this study. An ethnographic study would be useful in a study about cultural change (Watkins, 2012), but the explorative single case study design was more appropriate for this study because of time and resource restraints that required a bounded research topic. A phenomenological study could support the exploration of a shared experience (Yin, 2009), but would not sufficiently cover the cultural aspect of the study, or the continual changes occurring as the organization continues working to improve safety. This study is more applicable to the confirmation of existing theory rather than the development of new theory, which made the case study

design more appropriate than grounded theory. Each of the alternative qualitative designs might be useful in part, but the explorative single case study was selected because it was the appropriate tool to respond to the research question.

Population and Sampling

The population for this study included the staff of a sub-acute nursing facility. There are 480 employees in the organization. Of these 480 employees, 280 are situated within the flagship facility in which the HRO theory was first implemented. Purposeful sampling is used to identify participants that will best be able to answer a research question (Abrams, 2010). A purposeful criterion sample was suitable to select participants who were able to help address the research questions (West, 2013). The 10+3 rule (Francis et al., 2010) indicates a sample size of 10-15 participants was an appropriate starting point to achieve saturation. Fourteen nursing and respiratory staff were selected from the healthcare facility using a purposeful criterion sampling method. The participants were limited to nursing and respiratory staff employed before HRO theory was applied in the organization. A minimum of 2-3 participants from the respiratory and nursing specializations who met the selection criteria were selected to enhance the diversity of the data as recommended by Rubin and Rubin (2012). These healthcare specializations included Respiratory Care Practitioners (RCPs), Certified Nursing Assistants (CNAs), Licensed Vocational Nurses (LVNs), and Registered Nurses (RNs). In qualitative research, a small sample size does not detract from the validity of a study (Rubin & Rubin, 2012). The sample should be large enough to answer the research

question, but small enough that only relevant data is used (O'Reilly & Parker, 2013). Saturation was reached; so additional participants were not required.

The purposeful sampling used for this study limited eligible participants to the nursing and respiratory staff that were employed before and after the cultural transition toward reliability, and experienced the organizational culture transition. Abrams (2010) recommended that samples should consist of participants who had relevant experience sufficient to address the research question. The purposely selected nursing and respiratory team members in this study had the most relevant experience to respond to the research question. Nursing and respiratory staff that did not experience the organizational transition toward reliability were excluded from this study. Management and administrative staff who were managers during the transition period were also ineligible to participate. Current managers who were not managers at the time of the transition were eligible to participate.

Interviews took place in a meeting room assigned by organization administrators. The meeting room was located in an unoccupied wing of the building, apart from peers or supervisors. The room had limited access, and the participants were able to speak freely without being overheard. Participants should feel comfortable during an interview (Rubin & Rubin, 2012), and meeting in a familiar place was beneficial for the participant. Interviews were conducted individually to protect the participant's privacy and to encourage open communication. The interviews were conducted in person to build trust between the participant and me. Interviews were audio recorded. As a condition of

participation, I instructed each participant to sign the consent form prior to commencing the interview (Appendix B).

Ethical Research

When engaging in human subject research, the researcher must approach the study in an ethical manner. Ethics should not be relegated to a footnote in the study, but should be at the forefront of the study process, from the planning stage to presentation of findings (Canella & Lincoln, 2011). Hodges (2011) considered ethical research among the criteria for defining good qualitative research. Ethical human subject research entails open communication with participants, and an attempt to benefit the subject if possible (Hugman, Pittaway, & Barteolomei, 2011).

One possible source of harm comes from identification of the participant, whether directly or through the process of deduction (Librett & Perrone, 2010). To reduce the possibility of identification of the participants, any information that may be connected to the participant should be removed prior to distribution of the data (Damianakis & Woodford, 2012). Only de-identified data were presented or referenced in this study. Comments and notes were presented in aggregate form to reduce the potential for identifying a specific participant. If any raw data are presented in the future, the data will be stripped of identifiers prior to presentation.

Informed consent is required in ethical human subject research (Christians, 2012). The participant is informed of the research purpose, risks and benefits, and is provided an opportunity to ask questions of the researcher (Erlen, 2010). The participant should not feel compelled or coerced to cooperate involuntarily (Christians). The participant should

be adequately informed of their right to discontinue participation at will. I provided a consent form to each participant and explained what was expected from participants and the right of the participant to discontinue participation (Appendix B). This consent form included a statement on the purpose of the research, expected risks or benefits, a breakdown of what was asked of the participant, incentive information, and a declaration of the participant's right to stop participating at will (Appendix B).

Participants were permitted to refuse to answer specific questions, and were allowed to withdraw from the interview at any time. Each participant was informed of the right to withdraw participation at the beginning of the interview, and this right was reiterated in the informed consent form that the participant signed. Each participant was given adequate time to read the consent form, and was allowed to ask questions prior to signing the form.

I contacted managers at the target organization by phone to determine the number of qualified candidates, and requested a list of their names. Informational meetings at the target organization were used to introduce the study to potential candidates. My contact information was posted so that anyone interested in participating who met the selection criteria was able to contact me privately. This was done to reduce any feeling of peer pressure or group coercion. When a potential candidate expressed interest in participating in the study, he or she were reminded that participation was completely voluntary and that he or she may opt out without any repercussions. Each candidate was provided with an informed consent form prior to the commencement of the interview. Once the form

was signed the candidate was considered a participant. No incentive was provided to the participants to prevent biased results and to limit any sense of coercion.

The process of triangulation includes gathering data from two or more sources (Bekhet & Zauszniewski, 2012). Participants were interviewed, observations of nursing and respiratory staff interactions were conducted, and organizational documentation reviewed for data triangulation. Extensive notes were taken based on observations of interactions between care staff and other organizational personnel. These notes were used to improve validity and to enhance the quality of the data. All notes and interview transcripts were stripped of identifiers, and the coding was completed in aggregate form. This process reduced the likelihood of deductive identification of the participants. In the unlikely event that criminal activity or child abuse was discovered during data collection, authorities would have been contacted in compliance with legal requirements. No criminal activity or child abuse was discovered.

As referenced in the consent form, the participant was reminded that the data will be maintained for a minimum of five years. Identifiable data will not be released and will be stored in a secured location for five years. Electronic copies are stored on a password protected computer. Hard copies are stored in a locked container. Data will be presented to the organization upon request. Any data submitted to the organization will contain de-identified information, and will be presented in aggregate form. Removing identifiers will limit the ability of managers or administrators to determine the identity of the participant. After five years, hard copies of data will be shredded, and electronic copies deleted.

Data Collection

Instruments

The researcher is the instrument in a qualitative study (Xu & Storr, 2012). I used field observations, semistructured interviews, and document review to gather information on the implementation of HRO theory at the facility. These three data collection methods were used to strengthen the research findings through triangulation.

Triangulation is used in qualitative research to compare two or more sources of data (Bekhet & Zauszniewski, 2012). This comparison improves the quality of the collected data, and strengthens the validity of the data. Data were obtained through observation of nursing and respiratory staff, semistructured interviews with individual nursing and respiratory staff, and review of organizational documentation regarding the application of HRO theory and patient safety improvement. Semistructured interviews allow a researcher the flexibility to follow leads, while still maintaining a basic template from which to conduct the interview (Bernard, 2013). Observations took place during regular 30-minute intervals which included shift changes, clinical rounds, and daily duties. The interviews and observations were used to explore how the perceptions and experiences of nursing and respiratory staff affected the organizational transition toward reliability.

To understand how the perceptions and experiences of nursing and respiratory staff affected the organizational transition, I used open-ended interview questions as suggested by Rubin and Rubin (2012). These open-ended questions allowed the interview participants to describe the transition process in their own words. Allowing each

participant to describe the transition process in his or her own words enriched the data that was collected in this study.

Yin (2012) stated that in an explorative single case study, the researcher should seek to eliminate alternative explanations. Eliminating alternative explanations strengthens the validity of the study. The researcher should also actively seek to eliminate bias from the study. I sought to identify bias prior to the data collection process, and looked for rival explanations to avoid contaminating the research findings. A copy of the analyzed data was provided to the participants for feedback to ensure the analyzed data accurately reflects their responses.

Bernard (2013) recommended that researchers take notes during participant interviews. I took notes during each interview rather than relying solely on the audio recording for data. Field notes were taken during the interviews and during observations of interactions between nursing and respiratory staff. These notes contain observations and any other information relevant to the research question. The notes were entered into a database. This database was used in the analysis of the various sources of data. The raw data from this database will be presented upon request, without inclusion of identifiable information. The list of codes and relevant documentation were included in the study appendices once the data was analyzed.

As part of the triangulation process, observational data were collected. Observations took place outside the interview process. The organization holds scheduled rounds in which nursing and respiratory staff are able to exchange information in a group setting. Observational data were obtained during these rounds. Data was also obtained

during shift changes. These non-participant observations occurred without requiring or including identifiable information. Bernard (2013) suggested one option for observation is to take on the role of a complete observer. A complete observer does not interact with the group, but observes from a distance (Bernard). While observing nursing and respiratory staff during shift changes and group rounds, I took on the role of a complete observer. Notes were recorded based on interactions between care staff. These field notes were included in the research database.

Data Collection Technique

Case study research is comprised of multiple sources of data (Yin, 2012). Singh (2014) identified these sources as interviews, observations, and document reviews. The techniques used to collect data included observations of staff interactions, semi-structured interviews, and document reviews. I used semistructured interviews to enable additional information to emerge in the interview process. No additional questions were required for the collected data.

Semistructured interviews. Interviews were conducted face to face. I observed body language, and developed a rapport with the participants as suggested by Rubin and Rubin (2012). Interviews were audio recorded with a personal tape recording device. The interviews were transcribed verbatim. The recorded information enabled review of the data for any material missed through the initial analysis and coding. The interviews were conducted on an individual basis in a private room designated by the facility administrators. Because the leadership was interested in the outcome of this study, participants were allowed to participate in the interview during their scheduled work

period. Time was allowed for social interaction prior to and following the interview. Rubin and Rubin suggested a researcher should allow time for interaction to build trust with the participant. Allowing time for social interaction in this study helped build trust between the participant and me, and reinforced my newly established role as a student rather than former colleague.

Observation. Bernard (2013) suggested observational data should be collected during daily routines. Observational data were collected for this study by observing groups of caregivers during the course of their daily routines. I observed interactions between nursing and respiratory staff during shift changes and group rounds. Observations occurred during 30-minute periods. Organizational leaders granted permission to observe staff in the course of their daily routine (Appendix A). An observation guide was used to determine which HRO concepts are exhibited among the nursing and respiratory staff (Appendix C). These concepts include: (a) developing and maintaining standard processes, (b) implementing checks and redundancy to mitigate potential failure, (c) authority migration, and (d) developing teams that openly communicate about failure to prevent recurrence of unsafe incidents (Hartmann, Meterko, Zhao, Palmer, & Berlowitz, 2013). Extensive notes were taken during observations. These notes included data regarding staff interactions with peers and staff in non-clinical positions, general communication styles, and any occurrences or interactions that were relevant in answering the research question. These notes did not contain protected health information or compromise the rights of the patients. Identifiable information was not recorded.

Document review. Healthcare organizations maintain extensive documentation in compliance with regulatory agencies. This documentation was useful to confirm information obtained through interviews and observations. I reviewed the Policy and Procedure manual, de-identified statistical data on patient safety from prior research, data reflecting 911 emergency calls, hospital transfer records, and training documents. All documents reviewed for the purpose of triangulation were provided by facility administrators and did not contain patient identifiers. Proprietary information was not disclosed during the document review. This anonymity ensures that the patients and the organization are protected from unnecessary exposure.

Data Organization Techniques

Yin (2012) suggested that notes should be taken throughout the data collection process. Notes should be taken during and immediately following interviews to reduce the loss of valuable information (Yin). All notes and transcripts are retained in a secure location and will not be distributed without reasonable justification. Printed or electronic materials will be de-identified prior to distribution to maintain confidentiality and protect the identities of participants. Data is stored in a password-protected database, text files, and Microsoft Excel spreadsheets. Data were copied from the database to Microsoft Excel for analysis and are stored on a password-protected computer. All electronic data are stored on a password-protected computer. I am the only one able to access this data. All hard copies are stored in a locked container. A summary of the results was provided to the organization once identifiable information was removed. A written summary of the results was provided to an organizational liaison to distribute to each participant once

analysis was completed. A copy of the raw data will be retained in a secure location for a minimum of five years. After five years, if the data has not been used for subsequent studies it will be destroyed. Hard copies will be shredded, and electronic copies deleted when the data is destroyed. When the hard copies are destroyed, data will be deleted from all storage locations and backup devices.

Data Analysis Technique

The following interview questions were used to determine how the perceptions and experiences of nursing and respiratory staff affected the cultural transition into a reliability-seeking organization:

1.) What was the safety culture like at the organization before HRO was introduced?
2.) Describe the current safety culture in the organization.
3.) How did you perceive your role in the safety of your patients before learning about HRO?
4.) Describe how you see your role in the safety of your patients now.
5.) Describe your interactions with members of other departments before HRO was adopted.
6.) How did your interactions with these other departments change after learning about HRO?
7.) Describe how your daily tasks changed during the transition.
8.) Describe any policies or procedures that changed as a result of the transition.

9.) Describe how the managers and administrators handled the transition process.

10.) Describe the communication between departments since HRO was introduced.

11.) What influence did the application of HRO theory have in improving patient safety?

12.) In what way did the shift toward reliability affect your perception of the organization?

13.) How did the shift toward reliability affect your perception of your job?

14.) How could the transition have been managed better?

15.) How has HRO helped improve the lives of the patients?

16.) What components of HRO theory have been useful in reducing risks to patient safety?

17.) Describe any cost savings you are aware of since HRO was introduced.

18.) What were the most important improvements in patient safety since the transition toward reliability?

19.) What advice would you give to a new staff member who is first learning about HRO?

20.) What advice would you give someone who is first learning about HRO in another organization?

21.) What other information would be useful to understand HRO theory may be implemented to improve patient safety?

The interview participants were free to expand on these questions if desired, to be sure that any insight was understood in context. The interview participants were also able to ask questions about the study. None of the participants chose to ask additional questions.

In qualitative case studies, there is no preexisting method for analyzing the data as there is with quantitative computational software (Yin, 2012). Programs, such as NVivo, may be used as a tool to help analyze the data, but these programs are not designed to produce definitive results. A researcher needs to analyze the results once the program has completed any calculations. Data must be coded manually to identify themes and patterns. Manual coding includes creating matrices, tables, or charts to help organize recurring themes that emerge from the data (Yin, 2009). I coded the data obtained through observations and interviews based on repeated words, concepts, or phrases present in the field notes and interview transcripts.

Coding can include topical information at a surface level, or themes and concepts at a deeper level, with the latter being more challenging (Rubin & Rubin, 2012). Coding for themes requires advanced knowledge of the definitions to determine whether the concept or code fits with the established definition. Looking for recurring words or phrases is useful in the identification of themes (Noble & Smith, 2014), and was a primary identifier for the inherent themes in the collected data.

Frequently used words or phrases were organized by the frequency of use. Any similar topics were compared to assign primary and secondary codes. Primary codes can consist of multiple secondary codes, related in some manner to the primary code. As new

data were collected, they were compared against existing codes, and the coding was re-evaluated based on any additional data. The comparison and evaluation of data are in alignment with the flexible nature of qualitative research.

Microsoft Excel was used for the analysis of data. I did not use specialized coding software. The Excel software was used to organize and categorize codes, and sort the data in various ways to aid in pattern recognition. Excel was also used to create tables and figures used to illustrate the study findings in Section 3.

During coding and analysis, the data were compared with descriptions in the literature review of High Reliability Organizations. Any similarities or differences to the conceptual framework were noted and addressed in Section 3. This comparison aided in determining whether the application of HRO theory within the organization is reflected in daily practice. Comparison can also assist with generalizing the data, and in laying a foundation for other reliability-seeking organizations to follow.

Reliability and Validity

Reliability

Addressing reliability, the goal is to allow a future researcher to replicate the study, follow all the same methods of inquiry and analysis, and come to the same conclusion for a particular case (Yin, 2009). Reliability is different from generalizability because reliability specifically refers to repeating the same study within the same boundaries, and generalizability is geared toward using the same methods on a different case. To enable future researchers to follow the same path through the case, extensive documentation is necessary.

To achieve reliability in this study, I tape recorded all interviews and transcribed the recordings verbatim. Recording the interviews enabled me to review the entire interview rather than relying on memory. Extensive field notes were taken, containing observations and other relevant information. Providing this data may be useful to future researchers who may wish to repeat the steps to confirm any findings.

Validity

Validity may be interpreted differently in quantitative and qualitative research (Yin, 2012). These differences may include ideas about the credibility or authenticity of the study. There are internal and external factors to consider which are similar to quantitative research, though they are adapted to better suit the needs of a qualitative study. While experimental research is focused on removing rival explanations, qualitative research is focused on addressing those rival explanations that could provide plausible alternatives to the results of the study.

To ensure validity, all the information must be presented, even if it does not appear to fit with the rest of the findings (Gibbert & Ruigrok, 2010), and all plausible rival explanations should be addressed (Yin, 2009). Addressing rival explanations helps mitigate any appearance of bias or results that only support pre-conceived ideas. Interview participants should have relevant information and experience to address the research question (Rubin & Rubin, 2012). Finding interview participants who experienced the organizational transformation and were knowledgeable about HRO theory contributed positively to the validity of the study.

Internal validity can be affected by a researcher's influence or lack of influence on the population studied. If the participants do not trust the researcher, data may be skewed to reflect this lack of trust rather than present a true picture of the case (Rubin & Rubin, 2012). I built trust with participants to enhance the quality of the data. By explaining to the participant how the data may be used to help patients, the quality of the data was also improved.

External validity can include repeatability or the ability to transfer the data to another organization or case (Yin, 2009). One of the goals of this study was to address a specific business and social problem. If the data are not useful outside of the context of the study's population, it may not be a valid study externally, even if the data are useful internally. Case studies have been criticized for not presenting generalizable data, though the criticism stems from an attempt to compare analytical data against statistical data (Yin, 2012; Yin).

In qualitative research, triangulation enhances validity (Yin, 2012). Triangulation incorporates three sets of data, which are then compared to determine whether the three sources are in alignment (Colón-Emeric et al., 2010; Yin). For this reason, the research design included observational data, interview data, and a review of prior patient safety research and documentation within the target organization.

Transition and Summary

In Section 2, I described the research method, the purpose of this study, population and sampling, data collection and data analysis procedures, and data validation methods. The purpose of this qualitative, explorative single case study was to

explore how the perceptions and experiences of nursing and respiratory staff affected the successful transition of a healthcare organization into a reliability-seeking organization. Data were collected through individual interviews and through non-participant group observation of nursing and respiratory staff during group rounds and during shift changes. Interview participants who were present during the transition toward reliability were purposely sampled from the nursing and respiratory staff at the research site. Data were coded and were presented in aggregate to protect participant identities. Section 3 presents the findings and recommendations of the study.

Section 3: Application to Professional Practice and Implications for Change

This section presents the study findings on how the perceptions and experiences of nursing and respiratory staff affected the organizational transition of a subacute nursing facility toward reliability. The analysis of data uncovered parallel themes between the collected data and the conceptual framework of this study. Section 3 includes (a) an overview of the study, (b) presentation of findings, (c) application to professional practice, (d) implications for social change, (e) recommendations for action and for further study, (f) reflections on the study process, and (g) study conclusions.

Overview of Study

I conducted this qualitative, explorative single case study to explore the successful transition of a healthcare organization into a reliability-seeking organization from the perspective of the nursing and respiratory staff. The data collected for this study provides insight into the primary research question: How did the perceptions and experiences of nursing and respiratory staff affect the successful transition of a healthcare organization into a reliability-seeking organization? The following research sub-questions were explored in support of the research question.

1. What components of High Reliability Organization (HRO) theory were found to be useful in reducing risk to patient safety in a sub-acute nursing facility?
2. How did the nursing and respiratory staff contribute to changes that led to an improvement of patient safety in a sub-acute nursing facility?
3. How did the attitude of nursing and respiratory staff affect participation in the application of HRO theory?

I collected data from semistructured interviews of 14 nursing and respiratory practitioners who participated in the organizational transition. Secondary data collected from group observations and review of organizational documents were used for triangulation to strengthen the validity of the study. Interview participants were selected through purposeful criterion sampling. The research project was introduced to the staff at regularly scheduled meetings at the beginning of the day and night shifts, and the individual staff members were able to indicate by phone, email, or in person, their willingness to participate. Review of organizational documents including the Policy and Procedure manual, educational training documentation, and organizational research data occurred during the same site visit.

I conducted interviews over a four day period in October 2013. Participants were presented with information about the study, offered the opportunity to ask questions, and asked to sign a consent form prior to commencing the interviews. All of the participants agreed to have their voices recorded for transcription purposes. Names were not used in the recordings to help maintain participant confidentiality.

I used the Microsoft Excel software program to perform open coding of the collected data and to sort and analyze the data for word frequency and theme identification. Participants were asked for feedback during the interviews to strengthen the validity of the study results through member checking. The participants were asked to clarify their responses as needed. The initial open coding process produced a set of 15 frequently used words and terms. These *in vivo* words and terms were used as a starting

point to identify common themes, which were sorted and expanded within categories. The frequently used words and terms are listed in Table 1.

Table 1

In Vivo Codes

Term	Count
Teamwork	20
Lifting	14
Awareness	14
Communication	14
Bathing/Showers	11
Stay in room	10
White board	10
Hoyer lift	9
In-services	9
Send out	7
Transferring	7
Buddies	6
STAT calls	6
Not as strict (before)	3
Have each other’s back	2

The *in vivo* codes listed in Table 1 above were further refined and expanded through additional analysis of the data. I used selected coding to group similar codes based on a common theme. Notes from the memoing process throughout the study were also used in selected coding. Codes were also checked for similarities with HRO theory. Several themes emerged from this additional analysis. As themes were uncovered, they were assigned to the coded data. The number of times a code was applied to the data was counted in a frequency analysis.

Codes were checked against the existing themes as they were developed to determine if the codes were appropriate for an existing theme. If the existing themes were not appropriate, a new theme was designated. The following primary themes resulted from this analysis and are listed below:

1. Patient Care Improvements
2. Staff Improvements
3. Policies
4. Teamwork
5. Communication
6. Education & Training
7. Safety
8. Implementation Improvements
9. HRO is Beneficial
10. Job Perception
11. Perception of Organization

12. Management Handling

13. Quality of Life

14. Risk Mitigation

Themes 1-7 related to the application of HRO theory during the organizational transition toward reliability. These themes applied to research subquestion one regarding the application of HRO theory to improve safety. Themes 1-7 also applied to research subquestion two regarding the contributions of nursing and respiratory staff to the changes initiated during the transition toward reliability. Themes 8-12 provided insight into the employee attitudes and perceptions during the transition. These themes applied to research subquestion three regarding the effect the attitudes of nursing and respiratory staff had on the organizational transition toward reliability. Theme 13 identified the potential for social change. Theme 14 was related to patient safety, and the reduction of organizational risk applicable to business practice.

The *in vivo* codes from Table 1 and the primary themes listed above were used to determine saturation was reached. Participant responses were compared to determine saturation using the 10+3 model outlined by Francis et al. (2010). Saturation was reached by the ninth interview. Interview appointments that were scheduled prior to saturation were kept to strengthen the results and to maintain good faith with the remaining participants. Participant interviews 10-14 supported the responses from interviews 1-9. All participants who volunteered were included in the study.

Presentation of the Findings

Categorization of themes by research subquestion was useful in organizing and examining the primary research question. I used Microsoft Excel to code the collected data and conducted frequency and co-occurrence analyses. Some of the themes were applicable across multiple subquestions, which is reflective of the organizational culture. Participant responses were consistent with a shared culture, and many of the responses were similar from one participant to the next. This similarity suggests the education and training programs referenced by the participants were successful in creating a cultural understanding of safety. To ensure the accuracy of the findings, the themes that were applicable to more than one subquestion were not combined, but were kept within the context of the respective subquestion.

Research Subquestion One

The first research subquestion addressed in this study was: What components of High Reliability Organization (HRO) theory were useful in reducing risk to patient safety in a sub-acute nursing facility? Interview questions 1, 2, 8, 11, 15, 16, 18, and 21 were most relevant in addressing the first subquestion. Examination of organizational documents supported participant interview data. Similar codes were grouped together until a theme was identified. The number of codes applicable for each theme was counted, and the results are listed in Figure 1.

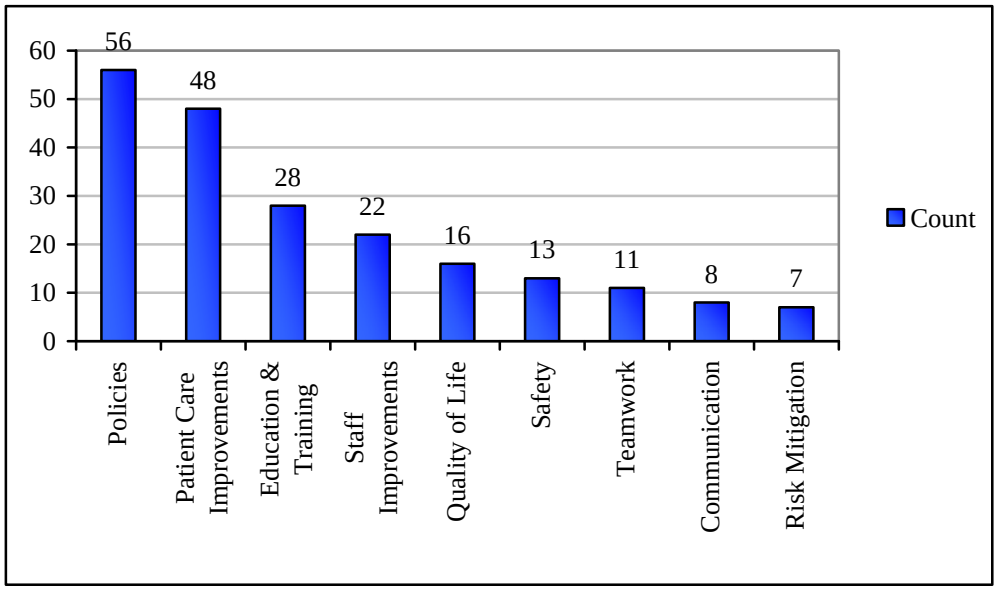

Figure 1. The frequency of themes in responses to Subquestion 1.

Policies. Participants discussed the introduction of new policies, or the enforcement of existing policies. Several participants noted that policies were not strictly enforced before the organizational transition toward reliability (Participants 2, 3, 6, & 11). Policy enforcement improved after the transition. Participant 6 said some of the policies were already in place, but the managers were stricter in enforcing the policies. Participants 1 and 4 described the communication of policies through bulletin boards and in-services. Participant 9 said that the medical director taught classes nearly every day, and introduced new policies to the staff. The process of implementation and enforcement of policies is still improving in the organization (Participant 1). Participants most commonly discussed policies concerning lifting and patient transfers, and staying in the patient rooms. The policies discussed by the participants were all consistent with HRO

theory. A review of Document 1 supported the assertions that policies supporting HRO theory were implemented as part of the organizational transition (Appendix E).

Many of the new or reinforced policies directly affected patient care, but some also affected employee safety. One change that positively affected employee safety was an increase in facility security. Two participants described these changes, including the addition of security cameras, locking of facility doors at night, increased lighting in the parking lots, and an increase in the number of hours security guards patrolled the facility at night (Participants 2 & 6). Two participants also talked about the no smoking policy, which affected patient safety and staff safety (Participants 6 & 13). The improvements in employee safety were perceived positively by the participants, who indicated they experienced better working conditions.

Specific policies that came out of the transition toward reliability included the requirement of staff coverage in the patient rooms at all times, that apnea monitors must be turned on at all times, that staff must test equipment before using it on a patient, weight limits, and that a minimum of two staff members must be present for bathing and moving patients. Regular in-service trainings, commonly referred to simply as in-services, are held to educate staff on new procedures or in response to safety incidents. Management staff enforced these policies, and the participants indicated the policies improved patient care. Participant responses regarding policies were grouped into subthemes as appropriate. These policy subthemes are listed in Figure 2.

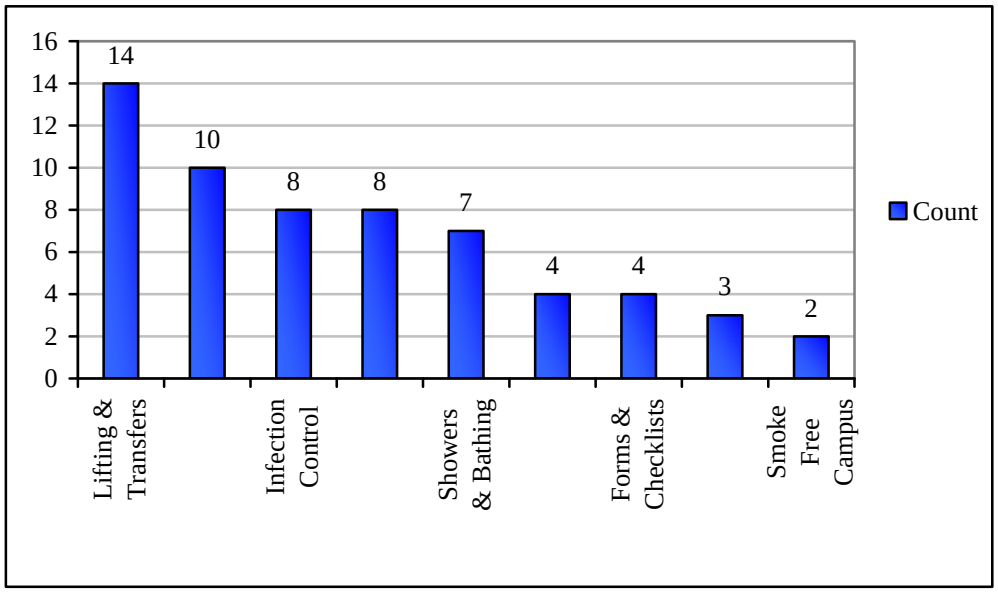

Figure 2. The subthemes identified by analyzing policy responses.

Lifting & transfers. Weight limits, lifting procedures, number of staff required, and equipment policies were all part of the Lifting & Transfers subtheme. Participant responses on equipment directly referenced included the hoyer lift and Apollo shower beds (Participants 2 & 5). Participant 13 said that staff learned to slow down when transferring patients to their beds. Policies on proper body mechanics and lifting techniques were also developed and enforced (Participants 2, 4, 5, 7, 11, & 13). These policies were designed to reduce the risk of staff or patient injury.

Stay in room. Every patient room must be attended at all times. If a nurse or respiratory therapist needs to leave the room, they must find a replacement (Participants 1, 3, 6, 8, & 13). Participants noted that managers enforced this policy after the transition toward reliability. Participants also discussed reasons that staying in the room was beneficial to the patients. Staff stopped leaving patients for extended times, and were

more attentive (Participant 6). Med carts were located in the patient rooms for easier access when needed (Participant 8). The participants viewed this policy as a positive change that improved patient safety.

I witnessed consistent adherence to the room staffing policy among the participants and during group observations. All participants who were in patient rooms prior to their scheduled interview found coverage for the patient rooms prior to leaving. The policy was also included in Document 1 (Appendix E). Staff was observed staying in their assigned rooms and asking for assistance if they needed to leave the room.

Infection control. This subtheme was comprised of references to infection control policies. Participant 8 said that infection control issues were addressed during the transition toward reliability. These issues included an increased focus on hand-washing (Participant 8). Participant 14 discussed how simple things like changing a tracheostomy tube tie after a bath could prevent skin irritations. The policy to change these ties immediately after a bath and with the assistance of another staff member was developed during this time (Participant 14). Participants saw the policies on infection control as successful in reducing preventable infections.

Strict adherence. Four participants said that policies were not as strict, or were not enforced before the introduction of HRO theory (Participants 2, 3, 6, & 11). The participants made similar comments stating that the policies were more strictly enforced after HRO theory was introduced. They also attested to the large number of new rules and policies that have been created since that time. Document 1 contains 10 binders of

policies and procedures (Appendix E). The number of binders supports the participant statements that there was an increase in the number of organizational policies.

One rival explanation for the increase in the number of policies could be the increase in healthcare regulations. Regulatory agencies require increasing volumes of policies to address safety and other issues. One component of HRO theory is the building of standard processes (Hartmann, Meterko, Zhao, Palmer, & Berlowitz, 2013), which in healthcare may translate into increased policies and procedures. The organization's intentional transition toward reliability makes adherence to HRO theory the more likely cause of the increase in the creation and enforcement of policies.

Showers & bathing. Before the transition toward reliability, patients could be bathed by a single staff member (Participant 1). Four participants said that bath buddies are now required for bathing (Participants 2, 7, 8, & 13). Staff works together to prevent injuries. If an incident occurs, the second staff member can seek help while the first person addresses the situation (Participant 13). Participants frequently addressed the theme of bathing and showering patients, as indicated in Table 1. The participants attribute the increase in safety in part to the changes in bathing policies.

Bed rails up. Patient bed rails are required to be up at all times (Participants 7, 11, & 13). This policy was developed to prevent patients from falling out of bed. Formerly sedated and inactive patients responded to changes in treatment and became more active, which presented the risk of falling that was addressed in this policy. The bed rails policy provides insight into the active assessment of preventable risk within the organization.

Forms & checklists. Participant responses regarding the five-point respiratory exam, transfer packets, and statement of staff concern forms were grouped into this subtheme. Forms were developed as part of the transition toward reliability. These forms and checklists were used to encourage staff feedback and reporting (Participants 1 & 7), ensure safe transfers of patients to other facilities (Participant 1), and for assessment regarding the patient's general wellbeing (Participant 3). Managers use forms for checking on patients and supporting staff (Participant 1). The anonymous "Statement of Staff Concern" forms were seen as a positive way to improve reporting of errors or unsafe conditions. Participant 1 viewed the walking rounds forms as helpful in making sure the managers and charge staff check in with all the staff to see if anyone needs help. Participants viewed the addition of forms and checklists as effective in increasing patient safety.

Get help. Participants responded that more help was made available to them during the transition toward reliability, and that the managers made clear to the staff that they are empowered to ask for help when they need it. One participant said that when a STAT call is announced, the STAT team immediately comes in to help (Participant 3). Participant 2's response to the interview question about safety improvements was that knowing it is okay to ask for help contributed to patient safety. Participant 2 responded to the question about changes in daily tasks and said that more help was available. This help included peers and managers. Managers were seen as being helpful and working with the staff. The policy to ask for help was beneficial to patients, who were treated faster, and the staff, who enjoyed reassurance, assistance, and a sense of community.

Smoke-free campus. Two participants commented on the smoke-free campus policy. Participant 6 said that this reduced the number of times staff would leave the patient alone because they could not go for a smoking break. Participant 13 brought up the smoking policy in the context of a car fire in the parking lot. I observed that the smoke-free campus policy was clearly posted in high traffic areas in the facility with an explanation about the policy. The nature of the illnesses many of the patients are diagnosed with makes them susceptible to reactions to the chemicals in cigarette smoke, according to the posted policy. This policy is consistent with HRO theory because it shows the management is looking for ways to mitigate risk across the organization.

Patient care improvements. All, but one of the participants indicated that the application of HRO theory improved patient safety or helped to maintain safe care. The remaining participant skipped the question. Participant 4 considered all the components of HRO theory effective in improving patient safety. Participant 3 stated that HRO had 100 percent influence on improving safety. Participants 1 and 3 felt that HRO had helped improve safety a lot, and Participant 5 said that the patients received better care. Participant 4 commented that patients are cared for as they should be if staff exhibits safe behaviors. Participants also indicated there were fewer safety incidents because of the transition toward reliability.

Participants described an increase in awareness because of the transition toward reliability. Staff was more available to patients and paid more attention (Participant 6). Staff was more careful and aware of their surroundings (Participants 1, 2, 4, 5, & 10). Assessments also improved during this time (Participant 9). Participant 10 said that there

was more awareness of safety issues, and that patient care improved because the staff was looking for the little things. The increase in awareness reflects the HRO concept of mindfulness.

One outcome from the increase of awareness was an early response to incidents as they happened. Participant 3 said that staff was able to get to an emergency before it became an emergency. Participant 12 said that interventions with patients were in response to observations of deteriorating conditions. The staff was able to respond quickly to these changes in conditions (Participant 9). These early responses and faster interventions are attributable to HRO theory. Mattox (2012) warned that repetitive tasks can put one in autopilot, where problems can be missed. Enck (2012) described Boyd's OODA Loop as a systematic process for observing and responding to a changing environment. The participant responses about increased awareness and being careful explain in part why the staff was able to respond quickly to incidents. The responses also help explain why there were fewer incidents.

The number and severity of incidents decreased because of the organizational transition toward reliability. Patients do not experience pain from improper lifting techniques (Participants 2, 5, & 11). Patient health improved, and fewer STAT calls were required (Participant 2). Patients were also sent out of the facility to the emergency room or hospital less often (Participant 6). Patients were treated in-house when possible (Participant 12). These improvements were attributable in part to the increase in infection control efforts (Participant 8). Patients also experienced fewer preventable skin

conditions (Participant 14). Participants attributed improvements in the health of the patients to the organizational transition.

Education & training. Participants reported changes in education and training programs after the introduction of HRO theory. In-services were most commonly discussed. Other subthemes related to education and training were cross-training, preceptor training, access to a knowledge base, continuing education, demonstrations and simulations, and the importance of training to improve safety. Most of the participants thought things had improved, but one participant cautioned that education needs to be made a higher priority again.

Participant 5 said that in-services were helpful. Participant 4 acknowledged the in-services, and added that the safety incentive program also helped improve patient safety. The safety incentive is part of an organizational effort to increase awareness of safety, increase reporting, and reduce the number of repeated error within the organization. In-service meetings are provided to the staff in response to incidents to increase organizational awareness and prevent future occurrences (Participant 1). In-services also serve as a reminder to the staff about organizational policies (Participant 5). Staff training was also commonly discussed.

Staff training is an ongoing process in the organization. Participant 6 said that training increased after the organizational transition. Participant 3 said that the training became more intense. The preceptor program was developed during the transition (Participant 8). Participant 11 said that the preceptor classes were helpful. New staff

should be trained well (Participants 3 & 11). Participant 12 suggested that peers who are excited about HRO should train the staff. Participants saw the value of ongoing training.

Nurses were cross-trained to understand the duties of respiratory care practitioners (Participant 8). Understanding how the respiratory care staff did their jobs enabled the nurses to notice problems and alert the appropriate staff member quickly (Participant 8). Participant 3 said that everyone was trained to hand ventilate the patients to be prepared for potential incidents.

Staff was trained to feel comfortable with equipment and procedures. New ventilators could have differences in features or battery locations, and these changes should be familiar to the staff using the equipment (Participant 6). Staff is also trained to use the hoyer lift and other equipment they need to perform their jobs (Participant 11). Simulations are used in reliability-seeking organizations (Riley, Davis, Miller, & McCullough, 2010), and were used during the transition process (van Stralen, Calderon, Lewis, & Roberts, 2008). The participants recognized the value of simulations and demonstrations in providing safe care.

Staff improvements. Three participants described how the introduction of HRO theory empowered them to do the job they were trained to do (Participants 8, 9, & 12). Decisions were placed in the hands of the staff, and they were trusted to make the right call based on their knowledge of the current situation and their experience. Participant 12 said that the doctors trusted the staff. Participant 8 said that the staff was empowered by having more access to information and tools. Staff was also empowered by providing input to managers regarding patient care or unsafe conditions that needed to be addressed

(Participant 8). Empowering staff to make decisions is consistent with the concept of authority migration in HRO theory (Singer, Lin, Falwell, Gaba, & Baker, 2009).

An additional feature of the empowerment subtheme was that staff was able to initiate ventilators without the immediate supervision of a physician (Participants 9 & 12). The process of ventilator initiation and the positive outcomes of this initiative were described in Document 18 (Appendix E). This positive feature of patient care within the organization has in recent years been rescinded, to the disappointment of the staff (Participants 9 & 12).

Improvements in working conditions were also discussed by three participants (Participants 2, 5, & 6). Participant 1 said that the staff enjoyed working at the facility, and pointed out the number of staff employed for over ten years to support the assertion. The number of staff on the floor was considered an improvement in the working conditions (Participants 2 &6). Participant 6 saw access to physicians as a positive change.

Quality of life. Early interventions, field trips, staff interactions, and increased comfort were described as improvements to the patients' quality of life. Two participants said that the patients are more confident in the care provided by the staff, and are not afraid to be moved or transferred (Participants 11 & 13). Participant 5 said that the patients feel like the staff cares about them. Patients also feel safer because of the organizational transition (Participant 13). Participants 9 and 10 said that the patients' quality of life has improved. The improvements in care implemented during the transition process have been beneficial for patients.

Patients receive innovative care at the facility. If the patient has trouble swallowing, the staff can use the sense of smell to assist (Participant 9). Other innovations include using patients' smiles as indicators of their comfort (Participant 9). Ventilator settings are also adjusted to allow the children to play.

Patients are more comfortable because their ventilator settings are set based on individual comfort rather than traditional ICU settings (Participants 9 & 14). Patients smile and play (Participants 8 & 9). Participant 1 said that the patients are happy. The staff plays with patients and has developed connections with the patients (Participant 6). As the patient conditions improved, they were able to participate in outings and activities.

Some of the patients have been to theme parks, aquariums, zoos, and other off-campus activities with the staff (Participant 8). They also participate in activities within the facility (Participant 13). The staff is comfortable with treating the patients while allowing the children to play to the extent they are able (Participant 8). Many of these children would be sedated in a traditional pediatric intensive care unit (PICU) setting.

Safety. In response to question one, four participants indicated that the care was always safe, but the care improved after the introduction of HRO theory (Participants 1, 3, 5, & 12). The concept of safe care made safer was repeated multiple times throughout the interviews. All participants considered the patient care provided to be safe. Participant 5 said that there are always ways to be safer.

Safety is seen as a priority within the organization (Participant 7). Two participants considered the care to be safe (Participants 3 & 10). Participant 6 said there was an overall improvement in safety at the facility. Participant 2 referenced the security

guards at night, and Participant 14 cited the prevention of skin irritations as evidence that the organization is safer.

Communication. Participants described better communication between departments because of the implementation of HRO theory. Staff members were asked for input (Participants 7 & 12). Staff was also notified of policy changes or other important information at the daily whiteboard meetings and in prominent announcement boards (Participants 1, 5, & 7). Managers and staff learned to communicate better with each other.

Managers encouraged staff to report problems immediately (Participant 7). Staff is encouraged to communicate with managers about break times, to help keep rooms covered and to ensure staff get breaks during their shifts (Participant 1). Managers are aware of the need to communicate with the staff (Participants 5 & 10). The increase in communication helped in distributing better information where it is needed (Participant 4). This better information contributes to organizational knowledge and supports a growing knowledge base within the organization. Teamwork is also improved when staff and managers communicate well.

Teamwork. Participants noticed an improvement in teamwork because of the transition toward reliability. Four responses indicated that teamwork was not good before the transition and improved because of the transition (Participants 1, 8, 10, & 12). Three participants discussed the assignment of buddies or teammates (Participants 1, 8, & 10). Participant 7 saw managers as more available and part of the team. Two participants also noted peer support, and that their work is a team effort (Participants 1 & 3).

Risk mitigation. Participants emphasized accident prevention as a way to improve safety. Power cords could not be strung across floors (Participant 2), and water needs to be cleaned up immediately to prevent slips and falls (Participant 4). Small items should be removed from patient beds to prevent choking or clogging of tracheostomy tubes (Participant 10). Participant 11 said that items are not allowed above the patient beds to prevent things from falling onto the patients. Staff also must test equipment before using it on patients to ensure proper function and reduce potential harm (Participant 5). The staff is encouraged to look for hazards and report them.

Subquestion one summary. The first research subquestion addressed in this study was: What components of High Reliability Organization (HRO) theory were found to be useful in reducing risk to patient safety in a sub-acute nursing facility? Themes from participant responses included policies, patient care improvements, education & training, staff improvements, quality of life, safety, communication, teamwork, and risk mitigation. Of these themes, policies, education & training, safety, communication, teamwork, and risk mitigation directly correspond with HRO theory. Subthemes in patient care improvements, staff improvements, and quality of life were also consistent with HRO theory.

Participant responses detailed the changes that occurred during the organizational transition toward reliability. Policies and procedures were implemented to protect the staff and patient from injuries. Staff was cross-trained to increase the response time to patients in early stages of a medical crisis. Managers and administrators encouraged communication, and communication requirements were built into organizational policies.

Managers held an open door policy to encourage staff to communicate any issues, problems, or concerns. The policies and procedures were useful in reducing the number of incidents, and in improving the health of the patients. Quality of life improved for the patients because of the transition toward reliability, and costs went down. All of these activities were consistent with HRO theory.

Organizational leaders implemented policies and procedures to develop and maintain standard processes. The policies and procedures were also used in implementing checks and redundancy to mitigate potential failure. Policies regarding the empowerment of staff and encouraging decision-making by the staff were in support of the HRO concept of authority migration, or letting the person with the most information make decisions. Teams were developed, and reporting was emphasized in support of the HRO concept of open communication between team members to reduce repeated failures.

Research Subquestion Two

The second research subquestion addressed in this study was: How did the nursing and respiratory staff contribute to changes that led to an improvement of patient safety in a sub-acute nursing facility? Interview questions 5, 6, 7, 10, 19, and 20 were most relevant to address the second subquestion. The themes for subquestion two mostly paralleled the themes for subquestion one. The benefits of implementing HRO emerged as an additional theme, and risk mitigation and quality of life were not applied to this subquestion. Primary themes four and five, communication and teamwork were most frequently applied to the participant responses. The themes for subquestion two are listed in Figure 3.

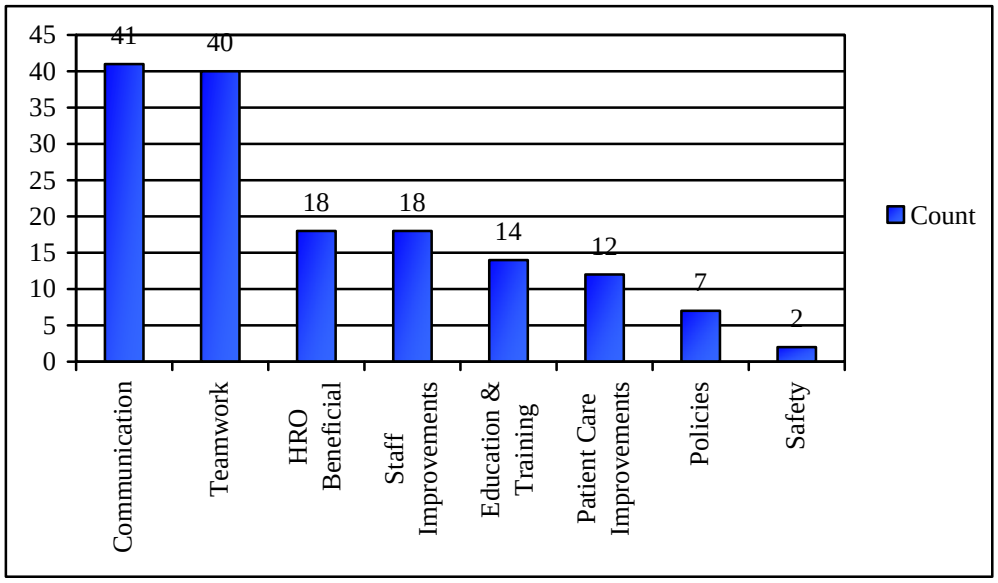

Figure 3. The frequency of themes in responses to Subquestion 2.

Communication. Subthemes representing communication included sharing information, reporting, communication between departments, and improvements in communication. Five participants indicated that communication improved after HRO theory was introduced (Participants 1, 4, 6, 8, & 11). Other responses included types of communication, the importance of communication, and the benefits of good communication.

Types of communication. Participants described communication during meetings, between departments, and with team members. Managers encouraged the staff to communicate with each other (Participant 6) and to management staff (Participant 1). One participant said approachable managers help facilitate communication (Participant 10). Participant 8 described improved communication with physicians. Three participants described communication at the daily whiteboard meetings (Participants 1, 5, & 7). One

participant said that departmental meetings helped improve communication (Participant 1). These meetings are useful in providing reminders to the staff about important issues.

One participant described the improved communication between shifts (Participant 1), and three participants described communications between departments (Participants 1, 4, & 14). Participant 4 said the staff improved in communicating with janitors and housekeeping about spills and other hazards. Another participant talked about coordinating schedules with other departments to ensure enough staff is available for bathing the patients (Participant 14). One participant stressed that nurses and respiratory staff need to communicate with each other (Participant 1).

Communication was also discussed in terms of reporting information and sharing information. Two participants talked about reporting hazards and reporting issues immediately (Participants 7 & 13). Two participants said that new forms helped improve the reporting of information (Participants 5 & 8). Participants also discussed organizational knowledge (Participants 1, 2, 5, 6, & 10), letting the right person know what is going on (Participant 2), and sharing information about what is going on (Participant 1).

Importance of communication. Communication with team members can reduce the risk of accidents. One participant described the importance of communication while lifting a patient, and said that staff communication can prevent injuries to themselves or the patients (Participant 5). Participant 1 said that communication is important in response to the interview question about what to tell someone who is first learning about

HRO. Communication was considered important for preventing injury and for training staff members who are first learning about HRO.

Benefits of communication. Participants described benefits of communication as the ability to prevent injury (Participant 5), knowing what is going on (Participant 1), and that any issues can be addressed immediately (Participant 1). Three participants discussed how organizational roles factor into teamwork (Participants 1, 4, & 14). Two of those participants described an understanding or respect for each other's roles (Participants 1 & 14). One participant stated there was an improvement in the level of trust that other people were doing their jobs, and that everyone was working together for the benefit of the patient (Participant 3).

Teamwork. Three participants said teamwork was consistently good (Participants 2, 7, & 10), and one said it was not good before HRO theory was implemented (Participant 12). Three participants described divisions between departments (Participants 3, 8, & 14), and how each department worked without other departments before the transition. Teamwork between departments improved after the transition (Participants 2, 3, 8, 12, & 13). Participant 8 said that interactions with doctors improved.

Managers started looking out for and helping members of other departments (Participant 1). Mangers were also more available on the floor to help charge and care staff (Participants 1 & 2). Staff received more help from peers (Participant 2). Staff was encouraged to ask for help when needed (Participant 1). Support was also built into organizational policies. Certified Nursing Assistant (CNA) and Respiratory Therapy (RT) staff were required to help the licensed nursing staff change tracheostomy ties

(Participant 14). This requirement necessitated flexibility in scheduling, to accommodate the help received from other departments (Participant 14). The staff received more help after the organizational transition. The staff also began to recognize how other departments contributed to patient safety.

The staff recognized that everybody was working together for the patients, and that everything was being done for the benefit of the patients (Participant 3). There was a sense of a common purpose, or a single mind (Participant 12). Staff understood better the role of individuals and departments (Participant 12). After the transition, staff began collaborating on shift reports to make sure all pertinent information was included (Participant 1). Staff recognized and respected the importance of other jobs (Participant 3). The organizational transition toward reliability was effective in strengthening teams, and improving the views staff had of other roles in a shared effort to take care of their patients.

HRO is beneficial. Responses to interview questions 9 and 10 were grouped into this subtheme about how HRO theory is beneficial. Questions 9 and 10 were about advice the participants would give to people within their organization and in other organizations learning about HRO theory. The questions were designed to help determine staff attitudes about transitioning into a reliability-seeking organization. Participant responses were all positive, and none of the participants reported negative outcomes from the transition.

One participant said that HRO was useful in everyday life, outside of work (Participant 3). Two participants said that HRO is useful in preventing incidents (Participants 3 & 14). One participant described HRO as a new approach to care

(Participant 12), and another said that HRO is why the organization is safe (Participant 3).

Participant 2 said that the transition toward reliability is a good experience, and nothing negative has come from it. One participant challenged recipients of this advice to let the participant demonstrate how HRO works (Participant 12). Two participants suggested that people learning about HRO keep an open mind (Participants 10 & 12), and Participant 10 added that people should embrace it. Participant 9 said that someone implementing HRO theory would have a good experience. Participants felt that HRO theory was useful and effective. They recommended other organizations implement the theory to improve safety.

Staff improvements. Participants reported improvements in their work environment, the way they work, and enjoyed a sense of empowerment because of the organizational transition toward reliability. One participant said the staff is more comfortable with management and physicians (Participant 8). Another participant described the availability of additional equipment to help with daily tasks (Participant 2). Three participants described a sense of empowerment. Staff was encouraged to make decisions, and to do what they knew how to do (Participants 6 & 9). Physicians listened to what staff had to say (Participant 8). Two participants also said that their relationships with coworkers improved (Participants 1 & 8).

Participant 12 said that the approach to patient care is different. Participant 7 said that the staff was all on the same page, and Participant 12 described the change as a thinking culture. Staff felt like part of the team (Participant 12). Participant 13 said that

the staff experienced fewer injuries. The changes in culture within the organization resulted in fewer injuries to staff, a common purpose, and a sense of community.

Education & training. Responses about education, access to a knowledge base, meetings, in-services, and learning were grouped into a subtheme for Education & Training. Participant 1 said that education is important. Participant 2 talked about how the departments grow and change together. The growth and change response fit with what another participant said about the need for continual in-services and training (Participant 1). Two participants discussed whiteboard meetings, in-services, and competencies (Participants 1 & 5). Participant 5 said the staff needs to learn from mistakes and that the staff needs to know what mistakes to avoid. These ideas fit with the concept of an organizational knowledge base, which is consistent with HRO theory. In offering advice to new staff, participants suggested learning as much as possible (Participant 13), manage time wisely (Participant 14), and that the extensive training new staff receives will indeed be used on the floor (Participant 8). The participants felt that education was important. Participants acknowledged the various ways they receive ongoing training, and recommend new staff learn as much as possible through these training options.

Patient care improvements. Participants described a better sense of awareness about what was going on, improved outcomes from patient incidents, and improvements in response times. Five participants discussed how the staff pays more attention, and is constantly aware of the things going on around the patients (Participants 2, 3, 6, 7, & 12). Participant 4 noted that hazards were addressed quickly. One participant said that outcomes improved when safety incidents occurred (Participant 12). Two participants

discussed early interventions (Participants 8 & 12), and Participant 8 suggested that knowing the patient's normal status could contribute to early recognition of problems.

Policies. Two participants said that the policies became stricter because of HRO (Participants 6 & 11). Participant 11 suggested that an organization should set and enforce policies to improve safety. Two participants discussed daily checklists and changes in assessment forms (Participants 1 & 8). Participant 13 said the policy for using a hoyer lift was helpful. Participants acknowledged an increase in policy enforcement during the organizational transition toward reliability. The participant responses indicated positive reception of these policies.

Safety. Two participant responses focused on safety in relation to subquestion two. Participant 4 said that there is always a way to be safer. This idea reflects HRO theory, where safety is a work in progress, not a one-time activity. Participant 4 also talked about safety in response to the interview question on how daily tasks changed. The organizational focus was on patient safety, and staff safety (Participant 4).

Subquestion two summary. The second research subquestion addressed in this study was: How did the nursing and respiratory staff contribute to changes that led to an improvement of patient safety in a sub-acute nursing facility? Themes uncovered in examining this subquestion included communication, teamwork, the benefits of HRO, staff improvements, education & training, patient care improvements, policies, and safety. Of these themes, communication, teamwork, education & training, policies, and safety directly relate to HRO theory. Elements of staff improvements and patient care

improvements are also found in HRO theory, particularly those elements involving empowerment, awareness, and mindfulness.

Participants described improvements in communication that contributed to patient safety. These improvements included maintaining and disseminating organizational knowledge, and ongoing reminders of policies and potential problems. Inter-departmental teamwork improved, and staff recognized the value and importance of other roles. When asked to offer advice to people first learning about HRO, participants suggested HRO is beneficial, can improve safety, is for the good of the patients, and that it works. Participants also noted improvements in the work environment, and described a sense of empowerment in their jobs. Participants considered education important, and the need to learn from mistakes was stressed. Patient care improved through better awareness, and the staff actively looked for and quickly addressed potential problems. Policies were adapted during the transition, and enforced. Participants noted that even a safe organization can find a way to be safer.

Staff contributions to changes that led to improvements in patient safety included openly communicating with peers, managers, and other departments; contributing to improvements in teamwork by working together for the good of the patients, watching out for problems and quickly addressing them, making decisions and doing the jobs they were trained to do, sharing information about mistakes to contribute to organizational learning, following the increasingly strict policies, and consistently looking for ways to be safer. Participants saw the value in the organizational changes, and actively worked to

achieve the changes. A new culture developed within the organization that focused on awareness, team work, and the sharing critical information to improve safety.

Research Subquestion Three

The third research question addressed in this study was: How did the attitude of the nursing and respiratory staff affect participation in the application of HRO theory? Interview questions 3, 4, 9, 12, 13, and 14 were most relevant to address the third subquestion. The themes of communication, policies, and teamwork were present in the responses for subquestion three, but to a lesser extent than some new themes. Participants experienced an improvement in their work environment, job perception, and perception of the organization. There were also a number of subthemes relating to how the implementation of HRO theory could be improved. The number of times these themes were applied was mostly consistent, and the theme of staff improvements was only slightly predominant. The themes applicable to subquestion three are listed in Figure 4.

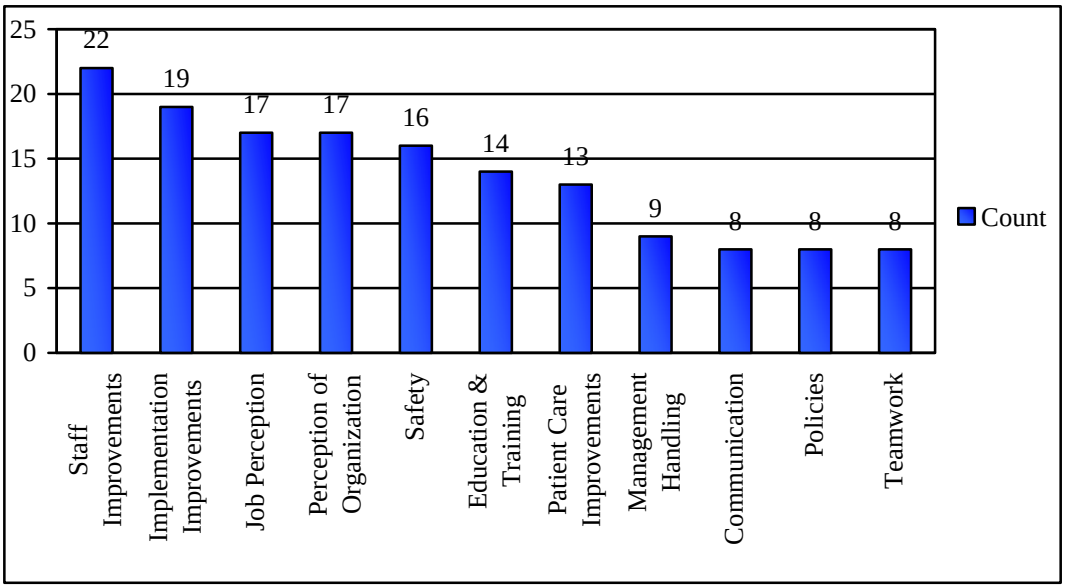

Figure 4. The frequency of themes in responses to Subquestion 3.

Staff improvements. Twenty-two of the themes from subquestion three centered on improvements in the work environment of the participants. Empowerment made up the bulk of the subthemes in this category. The other subthemes included staff injuries, confidence in peer performance, and being proud to work for the organization. None of the participants indicated that the organizational changes were a problem.

Empowerment. Three participants discussed the subtheme of empowerment over four of the interview questions. Participants felt empowered to provide input, and that their decisions were meaningful (Participants 8 & 12). Participant 8 discussed the opportunities to provide input about patients or about things happening in the facility. Participant 12 talked about the ownership of decisions because they were given the opportunity to make those decisions. The decision by the management to avoid casting

blame after an incident also factored into the staff's perception of empowerment (Participant 12).

Implementation improvements. Participants were given the opportunity to discuss the management of the organizational transition toward reliability. Five participants indicated that no changes were needed, or that the transition was handled well (Participants 6, 7, 9, 12, & 14). Participant responses regarding improvements in the implementation included education and training programs, communication, and available management.

Training and education topics were covered in four participant responses. Participant 3 said that more training would be helpful. Participant 5 specified that monthly in-services would be helpful. When changes are implemented, management should provide more education about the changes (Participant 2). These educational programs should be applied to the right audience by the right staff members (Participant 3). Participant 3 went on to talk about training for specific scenarios. This suggested training is reflective of the simulation techniques favored by practitioners of HRO theory (Riley, Davis, Miller, & McCullough, 2010).

Participant 1 talked about improving communication at meetings in the form of reminders to ensure the staff was more aware of the transition processes. Participant 11 suggested that consistent and ongoing enforcement of policies is helpful. Participants considered administrative support of the changes as helpful. Though the management presence was appreciated, Participant 8 indicated that administrative staff could also help by being available on the floor during an organizational transition. Participants indicated

that education and training and a managerial presence on the floor would be helpful for an organization considering a transition toward reliability.

Job perception. Participants described improvements in the perception of their jobs because of the organizational transition. Two participants described a better feeling about their jobs (Participants 8 & 9), and that the roles they played were important (Participant 8). Staff felt a reduction of stress that coincided with the reduction in STAT calls, sending patients out to the emergency room, and other preventable incidents (Participants 6 & 14). These reductions also provided more time for staff to focus on their duties rather than responding frequently to emergencies (Participant 14). Staff also recognized that though some tasks like bathing took longer to complete because of the team approach, the care was safer (Participant 14). Participant 1 said that the goal was to provide the best possible care for the patients. Participant 4 said that safety is the job.

Participants felt excited, empowered, and secure in their jobs. Participant 12 said that the job was made more exciting because the staff was able to face and overcome challenges. Participants felt secure in their jobs (Participants 6 & 7). Participant 3 described an improvement in staff confidence in their jobs. Staff also felt trusted (Participant 12). These statements support early assertions that the staff enjoys working in the organization.

Two participants described the prioritization of safety and of a team approach to safe care for the residents. Participant 13 said that the staff was aware they could work together for the safety of the patient. This knowledge contributed to a stronger team environment. Participant 2 said that staff knew that making patient safety a priority

simultaneously improved working conditions and was perceived positively by staff. The prioritization of patient safety had a positive impact on the staff.

Perception of organization. All of the participants described a positive improvement in their perception of the organization because of the transition toward reliability. Participant 2 said that the organization felt more like a family than a business. Three participants said there was a positive change, and that the transition was a good thing (Participants 5, 8, & 13). Participant responses representing perception of the organization also concerned safety.

Participants felt that the managers cared about safety for residents and for the staff (Participants 1, 2, 4, 7, 9, 10, 11, & 14). Participants 4 and 9 said the organization is safer. Participant 10 made a similar comment, and added that the organization actively made things safer. Participant 11 said staff considered the organization to be working for patient safety. Participant 8 said that the care of the patients was a main goal. Participant 14 said that the organization valued the importance of safety. The organization was positively perceived as improving the safety of residents and staff.

Staff thought about the direction the organization was heading (Participant 10). One participant described the perception that the organization was a leader in its field. Participant 9 talked about the conferences in which the medical director and other administrative leaders presented posters. Participant 9 also talked about innovative care, including using smell to help patients swallow, and using patient smiles as an indicator of comfort. Staff saw the presentation of research to schools and other organizations positively.

Safety. Participants were given an opportunity to describe changes in how they perceived their role in safety before and after the organizational transition toward reliability. Three participants said that safety was a priority before and after the transition (Participants 2, 5, & 8). Others described differences in safety before the organizational transition toward reliability. Participant 4 said that staff felt responsible for the safety of all patients and staff. Participant 7 noted the improvements in reporting unsafe conditions. Participants described changes in patient assessments. Participant 3 said that focusing on safety is important because a mistake affects the lives of the patients. Safety as a top priority within the organization was a consistent theme in participant responses.

Education & training. Participants described the various types of training available within the facility. Doctors and managers participated in training on the facility floor (Participants 7, 8, & 9). Participant 10 said that the staff did not always see the reason behind the extensive training, but when an incident occurred the reasoning became clearer. Two participants said that the number of in-services increased (Participants 5 & 8), and Participant 3 discussed ongoing training.

Training also occurs as needed within the facility. When a staff member is told about a potentially unsafe behavior that needs to be corrected, it needs to be done without finger pointing or blame (Participant 10). The concern about removing blame was supported in the literature about barriers to reporting (Alhatmi, 2011; Moumtzoglou, 2010) and in the avoidance of blame that is part of HRO theory (Singer, Lin, Falwell, Gaba, & Baker, 2009). Two participants discussed the emphasis on learning from mistakes, and more information was made available to the staff (Participants 4 & 8).

Participants also discussed the training of new staff. Participant 3 said that new staff needs to be well trained. Participant 12 said that the trainer needs to be an HRO cheerleader. Protocols need to be regularly updated to make sure the staff is trained on the most current procedures and best practices (Participant 13). The training of new staff and regular training throughout the year reflect the HRO concept of continually working to achieve reliability.

Patient care improvements. Six participants discussed improvements in the care of patients. The staff is more attentive to and available for the patients (Participants 1 & 6). Two participants felt the care was always good, but indicated things improved because of the organizational transition (Participants 10 & 12). Participant 2 said that the number of patient injuries was reduced. Participants 6 and 12 said that unsafe conditions are caught earlier, which helps keep the residents safer. The comments on catching problems earlier are consistent with what Participant 5 said about being more aware of surroundings and Participant 1 said about being available to the patients. Participants saw the increase in awareness and availability as effective in reducing patient injuries and in providing early responses to patient conditions.

Management handling. Participants were given the opportunity to assess the management of the organizational transition toward reliability. Three participants said the managers did a good job with the implementation of HRO theory (Participants 2, 5, & 6). Participant 9 added that the managers stuck to the plan, indicating further approval of the management handling of the transition. Participant 11 said that the managers followed up on and enforced policies. Participants felt that the managers believed in what they were

teaching, and recognized that the managers wanted the staff to participate in the transition (Participant 3).

Communication. Changes in reporting were covered in five of the participant responses related to communication. Participant 7 said that there was less emphasis on reporting before the organizational transition toward reliability, and that it was emphasized after the transition. Staff is encouraged to report whatever they see (Participant 10). Volunteers report to staff members anything they see that is potentially unsafe (Participant 6). One participant discussed how staff members are able to make suggestions regarding the care of the patients, and that they are willing to receive suggestions in an open line of communication with each other (Participant 14). Participant 1 indicated that communication is good within the organization.

Policies. Three participants discussed organizational policies on bathing, lifting & transfers, and patient room staffing requirements relating to subquestion three. Participants commented on equipment including the hoyer lift and Apollo beds (Participants 2 & 13). Participant 11 discussed weight limits that were imposed to improve safety (Participant 11). Staff is required to lift in teams (Participant 11). Staff must also use a buddy system for bathing patients (Participant 13). Participant 1 discussed the policy requiring staff to remain in the room or find coverage before leaving.

Teamwork. Participants noticed an improvement in teamwork stemming from the organizational transition toward reliability. Two participants talked about giving and receiving help from other departments (Participants 1 & 12). Another participant suggested the teamwork improved because of awareness of departmental roles

(Participant 10). Managers participated on the floor and acted as part of the team because of the transition (Participant 8). The transition also affected how staff saw teamwork in relation to their roles in the organization. One staff member said that staff now looks out for patients in other rooms, and not just the rooms they are assigned to cover (Participant 4). Participant 1 indicated that the teamwork is good. Participant 7 said that the staff works together as a team. These comments on teamwork indicated that interdepartmental teamwork improved because of the organizational transition toward reliability. Management staff also became more involved in team efforts.

Subquestion three summary. The third research question addressed in this study was: How did the attitude of the nursing and respiratory staff affect participation in the application of HRO theory? The research themes related to subquestion three were staff improvements, implementation improvements, job perception, perception of the organization, safety, education & training, patient care improvements, management handling of the transition, communication, policies, and teamwork. The theme of staff improvements was most commonly applied to participant responses, but the other themes were applied in similar numbers.

Staff felt empowered and confident in their ability to make decisions. Participants felt that the transition toward reliability was handled well, and thought the implementation went well. Participants suggested that improvements in communication, education, and training could have benefited the transition process. Patient care improved during the transition. Staff was able to respond quickly to patient changes of condition because they were more aware of what was going on. Participants felt proud to be

connected to an innovative institution. A culture of safety was developed within the organization, and teamwork and communication improved as part of this new culture.

The attitudes of the staff concerning the organizational transition toward reliability were positive. A few staff members were concerned about some backsliding, specifically in terms of staff empowerment in recent years. The empowerment felt by staff during the transition affected the perception staff had of their jobs and the organization. Participant responses indicated that patient safety was the priority, which they considered a positive change.

Conceptual Framework Concepts

The conceptual framework for this study was High Reliability Organization (HRO) theory. The data analyzed in the three subquestions was compared to the following components of HRO theory: a.) developing and maintaining standard processes; b.) implementing checks and redundancy to mitigate potential failure; c.) deferring to individuals with the most information; and d.) developing teams that openly communicate about failure to prevent recurrence of unsafe incidents (Hartmann, Meterko, Zhao, Palmer, & Berlowitz, 2013). These components were reflected throughout the participant responses.

Standard Processes. Organizational leaders developed and implemented policies to improve the safety of the patients and staff, and to identify potential problems earlier. Staff is required to stay in their assigned patient rooms at all times, or find a replacement before leaving (Participants 1, 3, 6, 8, & 13). Bed rails must be up at all times to prevent patients from falling (Participants 7, 11, & 13). Managers also

implemented certain infection control procedures. Staff must change tracheostomy ties immediately after patient baths to prevent irritated skin conditions (Participants 1 & 14).

Managers conduct interdepartmental white board meetings at the beginning of shifts. These meetings serve as mini in-services if an incident has occurred, or to remind staff of certain policies or procedures (Participants 1, 5, & 7). These meetings are useful in maintaining organizational awareness and helps in quickly addressing safety issues.

Checks & Redundancy. Thomassen et al. (2011) said that checklists are useful to address everyday risks. Checklists and redundant procedures were developed in the organization. Managers use checklists as they make rounds (Participant 1). Transfer packets are also included any time a patient is transferred to ensure medication and relevant patient information is passed on to other care givers (Participant 1). Patient assessment forms were adapted to improve the quality of reporting, which prompted staff to include critical information that might have been forgotten (Participant 8).

Checks may also include enhanced reporting. Staff has access to a form designed to enable anonymous reporting of incidents or unsafe conditions (Participant 1). This form serves as a check to make sure that managers know all the information, especially if it is something the staff is not comfortable discussing in public. Managers can distribute this information, and changes can be made as required. Organizational policies were also adapted to increase redundancy.

Organizational policies designed to improve redundancy included the bath buddy system, lifting procedures, and preventative care. Nursing and respiratory managers compare reports at the end of their shifts to make sure no information was left out of the

reports (Participant 1). Tracheostomy ties are changed and baths given with at least two staff members (Participants 1, 2, 7, 8, & 13). The second staff member can call for help if a problem occurs, and the other staff member can immediately begin addressing the problem (Participant 13). Weight limits are in place, and specific equipment is designated when bathing, lifting, or transferring a patient (Participants 1, 2, 4, 5, 7, 8, 11, & 13).

Authority Migration. The component of authority migration is found in the participant responses as empowerment or decision-making. Frontline employees are often better able to notice subtle differences in the condition of a patient, which makes them an ideal resource for discovering potential problems (Mauelshagen, Denyer, Carter, & Pollard, 2013). An organization with a strong safety culture will empower employees to make decisions (Singer, Lin, Falwell, Gaba, & Baker, 2009). These concepts were seen in the participant responses.

Participant 6 discussed early responses, stating the staff is able to catch potentially unsafe things quickly. Participant 12 made a similar statement, indicating that the staff was able to recognize the early signs of a problem. These responses are representative of similar comments made by several participants. The responses support the idea that the frontline staff is able to recognize subtle changes that might not be easily detected by management (Mauelshagen, Denyer, Carter, & Pollard, 2013). An organization that recognizes the value of early detection would do well to empower employees to make decisions to quickly address unsafe conditions.

Participants consistently described the concepts of decision making and empowerment. Staff felt that they were given the opportunity to provide input in the care

of the patients (Participant 8). Participant 12 said that because the staff was empowered to make decisions, the staff took ownership of their decisions. The empowerment resulted from the implementation of HRO (Participant 9). Participants commented that they were well trained in their fields, and that management recognized this training by empowering them to make decisions (Participants 6 & 12).

Communication & Teamwork. The primary themes of *communication* and *teamwork* most closely reflect the HRO component of communication and teamwork. Whiteboard meetings are used to convey reminders about duties and policies, and to alert the staff to problems that need to be addressed (Participant 5). In-services are conducted in response to safety incidents (Participant 1). Participant 12 said that the use of a knowledge base helped to make patients safer. Staff would also consult other staff members to make sure no details were missed (Participant 12). Participant 3 suggested that showing how things can go wrong if the policies are not followed is useful in training new staff. This idea was similar to what Participant 8 said about how important it is that new staff absorbs the training received in preceptor classes. Participant 12 discussed how failures may be system problems rather than individual problems, which is consistent with what Roberts and Bea (2001) said on the matter. Failures are regularly reflected upon within the organization to prevent future occurrences. Additionally, pertinent information is communicated to relevant staff to prevent potential failures.

Participants discussed differences in communication that occurred because of the organizational transition toward reliability. Some of the participant responses were about the sharing of information with team members. This includes letting other departments

and colleagues know what is going on with a patient (Participants 5 & 6), sharing insights or lessons learned with other team members (Participant 10), or making sure relevant information is passed on to the appropriate personnel (Participant 1).

Teamwork was also a common theme in the participant responses. The types of teamwork frequently referenced by the participants included departmental integration, lifting or bathing in staff pairs, and other similar team activities. The concept of teamwork relating to HRO theory also includes how participants saw their roles within the organization. Participant 12 said that with HRO theory, staff is aware of their roles within the team. Participant 7 said that the staff is on the same page. The staff is aware of the role they play in safety (Participant 8). These comments are representative of the larger theme of teamwork within the organization. The staff feels confident that they play a significant role in keeping patients and fellow staff safe.

Applications to Professional Practice

The primary responsibilities of nursing and respiratory staff are typically associated with providing service to the patients rather than business operations like finance, accounting, or administration. Participants were asked about the potential cost savings resulting from the organizational transition to explore new perspectives that may be relevant to the operational side of patient care. Participant responses corresponded with increased billable care, reduction of supply costs, and lowering the cost of care through reduced lab work and visual assessments. These themes were consistent with the cost savings found in Document 18 (Appendix E). The themes relevant to the study application to business practice are listed in Figure 5.

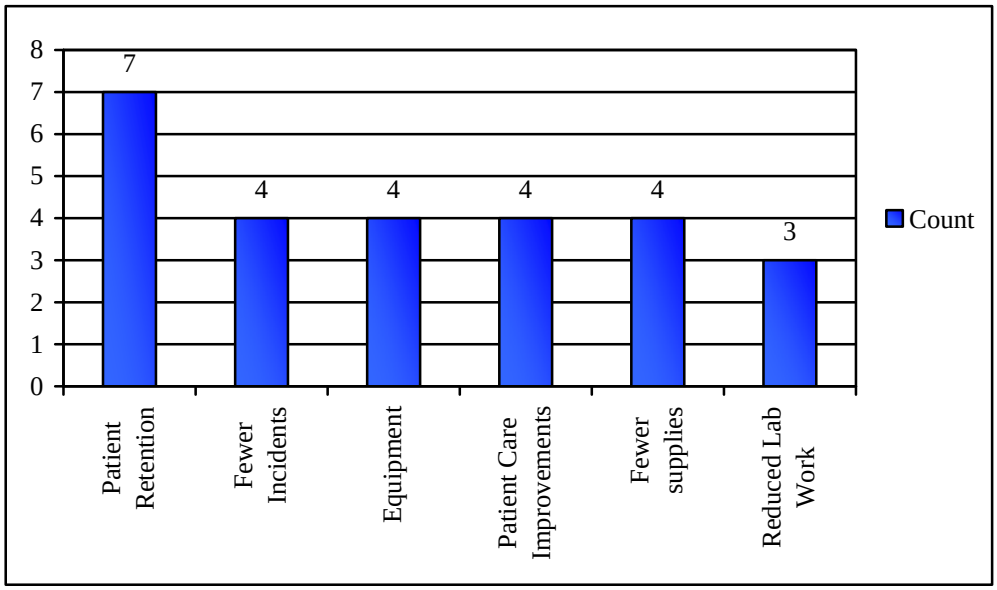

Figure 5. The frequency of themes in responses about business application.

Participants indicated that caring for patients in the facility and not sending them out to hospitals or the emergency room saved money (Participants 8, 11, 12, & 13). There were fewer safety incidents in the facility after the organizational transition toward reliability (Participants 5, 6, & 7). The fewer number of incidents may be attributable to the development of a safety culture in the organization. Participant 2 said that the environment changed. Participant 1 said that early responses and engagement with the patient contributed to the reduction in safety incidents.

Fewer incidents led to a reduction in supply costs. The costs to care for a patient rise if a patient gets sick (Participant 14). Supplies need to be stocked in STAT carts, and these supplies are not used as quickly because of the reduced number of safety incidents (Participant 8). There were fewer accidents when lifting patients because of the organizational transition (Participant 6). This corresponded with reduced staff injuries.

Sending staff to occupational health clinics is expensive, and these costs were reduced (Participant 7). Reducing the number of incidents reduced organizational costs for both patients and staff. Equipment changes also contributed to cost savings.

Participant 4 said that the organization purchased more and better equipment during the organizational transition. Equipment like the hoyer lift can reduce the number of staff injuries (Participant 4). Participant 3 said that the equipment lasts longer if the staff is careful and is not crashing into things. Participant 3 also said that equipment issues are reported to the maintenance team faster to ensure problems are addressed. The extra care given to equipment by care staff and prompt attention to equipment issues by maintenance staff contributed to a reduction of costs.

Developing a culture of safety can be beneficial for any organization. Every facet of the organization may benefit from a safe culture. Participant responses indicated that because of the organizational transition toward reliability, employees are happier, enjoy their jobs, feel empowered, openly communicate, and contribute to organizational knowledge. In addition to these benefits applicable to any business organization, a healthcare organization may also benefit through the reduction of risk, and the high costs (Debourgh & Pion, 2012) associated with unsafe care. These benefits extend to staff retention (Goh, Chan, & Kuziemsky, 2013) and job satisfaction.

Staff is adversely affected when a patient is harmed (O'Bierne, Sterling, Palacios-Derflingher, Hohman, & Zwicker, 2012). The psychological effects from harming a patient contribute to burnout and turnover. Participants noted that the staff is happy with their jobs, and that many of the employees had been working in the organization for over

10 years. The longevity of care staff indicates that the organization benefited by implementing a culture of safety, which is consistent with what Goh, Chan, and Kuziemsky (2013) suggested would result from removing blame from the organizational culture.

Though patient welfare as a measure of both social responsibility and customer service should be of primary concern to a healthcare organization, the improvements in patient quality of life and patient safety may benefit an organization financially. Fewer supplies need to be ordered (Participants 7, 8, & 14), patients remain in the facility (Participants 11, 12, 13, & 14), which keeps billable hours stable, and incurs fewer lawsuits. Regulators are also less likely to assess costly citations for unsafe care. These financial savings may provide cost savings sufficient to justify the application of HRO theory throughout the organization.

A review of internal facility statistics and research provided insight into the lower cost of caring for patients in a subacute facility rather than a pediatric intensive care unit (PICU) where these patients would be treated otherwise (Appendix E). These statistics were recorded around the time of the organizational transition. The subacute facility staff treated patients in the facility rather than sending patients to the hospital where costs for the emergency department, ambulance services, and emergency department physicians would be incurred. The organizational researchers compared the daily bed rate for three days in the PICU and four days in the subacute facility, and found the cost difference between subacute and PICU care was significant. Four days in the subacute cost $6,830 less than the PICU at the time the data were collected. There was also a significant cost

savings comparing the four days of PICU physician care to the three days physicians attended the subacute. There was a cost savings of $1,263 in the subacute facility. Not only is the care safer, it costs less. The rates are contrasted in Figure 6.

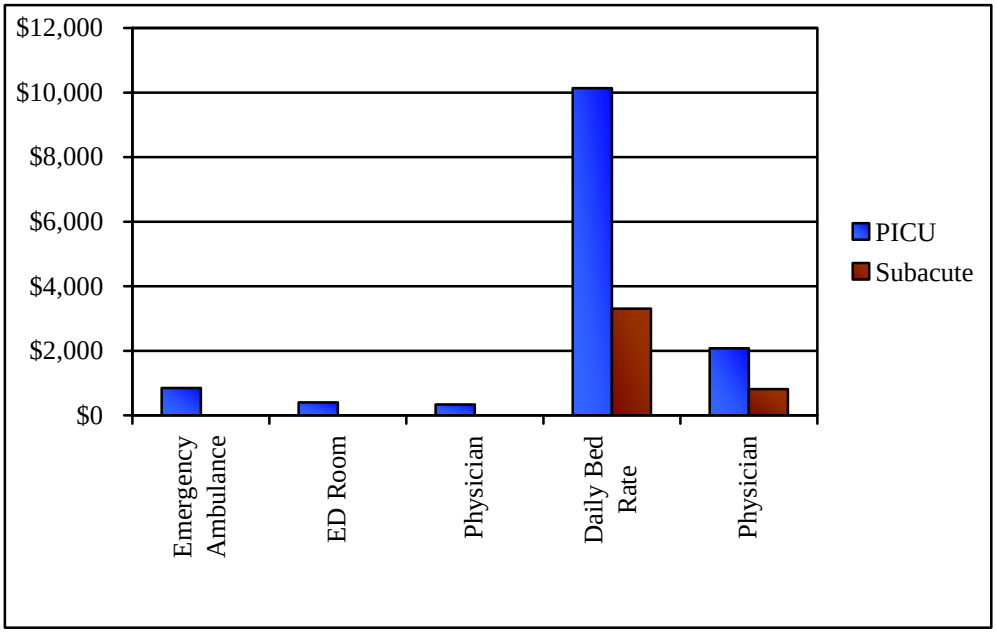

Figure 6. The differences in cost for services in a PICU and Subacute Care setting.

Healthcare organizations may benefit from applying HRO theory and transforming to a reliability-seeking organization. HRO theory did not originate in healthcare, but was successfully applied in a healthcare environment. Nuclear power (Hudson et al., 2012), NASA (Casler, 2013), public safety and fire-fighting (Weick, 1996), and the U.S. military are among the various industries that have benefited from high reliability research. HRO theory is applicable in industries that need to reduce risks.

Organizational learning, collective mindfulness, authority migration, reliability, and flexible systems contributed to the successful transition of a subacute healthcare facility into a reliability-seeking organization. Researchers witnessed these concepts in

organizations that operate in high risk environments and yet seldom fail (Sutcliffe, 2011). This study may be a useful guide for organizational leaders interested in reducing risks within their organizations. In this explorative single case study, participants indicated an improvement in the perception of their jobs and of the organization. Participants trusted peers to do their job, which reduced stress and improved job satisfaction. Patients received better care, organizational costs were reduced and revenues were increased by keeping patients in the facility. Teamwork and communication improved, and a culture of safety was developed within the organization. These outcomes of the organizational transition toward reliability are not limited to healthcare, and may be experienced wherever risks are high, and failure is catastrophic.

Implications for Social Change

The nursing and respiratory staff noticed a change in the quality of life of the patients under their care. These children were no longer sedated or kept uncomfortable through standard ventilator settings. When respiratory practitioners adjusted ventilator settings for comfort, the children became alert and began to smile and play. Children diagnosed with central nervous system diseases and typically confined to their rooms are now able to attend school and go on outings to amusement parks.

Healthcare organizations around the world care for children with medical conditions similar to those of the patients at the research site. Many of these children are cared for in an Intensive Care Unit (ICU), and are often highly sedated. If these organizations apply HRO theory, their pediatric patients might experience the same results as those described in this study. Applying HRO theory for this patient population

would mean that more patients would overcome their chronic illnesses and potentially start acting like children again. This change will not be a cure, but will enable the patient to enjoy a better quality of life.

Staff also benefits from the application of HRO theory. Perceptions of their jobs, the organization, and the impact they have on the lives of patients improve in a culture of safety. These perceptions contribute to satisfaction and longevity with the organization, and a desire to share knowledge with other organizations. Improving the collective knowledge base in healthcare about the innovative care that enables chronically ill children to smile and play is a positive social benefit.

Governmental regulations have not been effective in reducing preventable harm to patients (Downey, Hernandez-Boussard, Banka, & Morton, 2012). Physicians have created silos to protect themselves from unrealistic expectations of perfection (Sheps & Cardiff, 2011). Blame culture contributes to covering up incidents rather than improving organizational learning (Moumtzoglou, 2010; Saleh, Marias, Bakolas, & Cowlagi, 2010). Regulators may improve reporting by incorporating HRO theory into new or updated regulations. The increase in reporting could help propagate the theory throughout the industry, which would contribute to an industry-wide reduction in patient harm. This would reduce the estimated $38 billion (Debourgh & Prion, 2012) spent on addressing safety incidents, and improve the quality of life for patients.

Recommendations for Action

Some of the changes made during the transition toward reliability need to be reinstituted by the organization. A reliability-seeking organization should maintain

constant vigilance, and make course corrections as needed. The participants in this study indicated that while patients are still safe, some areas need improvement. These areas include a renewed commitment to education and training, and a reinstatement of some of the policies which empowered staff to work without a physician present.

The findings in this study will be useful in enhancing the education and training programs within the organization represented in this explorative single case study. Participants considered the implementation of HRO theory a success, and saw value in the education and training opportunities stemming from the implementation. Managers were perceived to have handled the organizational transition well, and staff appreciated their assistance on the floor. Managers should continue assisting staff and ensuring they are getting the help needed to maintain the safety of the patients and staff.

Some of the participants were enthusiastic in their estimation of HRO theory. These staff members should be encouraged and empowered to participate in organizational research projects. Posters outlining the organizational changes were presented at conferences as indicated in Document 18 (Appendix E). Updated data should be collected to determine the current state of safety within the organization. This will help with the reputation of the organization, and may continue to improve staff perceptions of the organization.

Healthcare organizations that have not yet heard of HRO theory will benefit by learning the theory and applying it to their organizations. The participants in this study recommended that outside organizations try it out so they can see that it works. Participants also volunteered to show how things improved if given the chance. Prior

quantitative research indicated that the health of critically ill pediatric patients improved, and that 911 emergency calls and patient hospitalizations were reduced after the organization transitioned toward reliability (van Stralen, Calderon, Lewis, & Roberts, 2008). The qualitative data collected and analyzed in this study support the prior research and may be useful in helping leaders in other organizations make a similar transition.

Business leaders in public safety, aviation, military, nuclear power, and other high-risk industries may improve organizational safety by implementing an organizational transition toward reliability. Research indicating the successful implementation of HRO theory across various industries is increasing and may be useful in developing an organizational culture of safety. As indicated by participants in this study, there are always ways to be safer. This concept of ever-improving safety is applicable to any organization that experiences risk.

Recommendations for Further Study

This study was limited to 14 respiratory and nursing staff in a small subacute nursing facility. A larger sample may be beneficial in a future study. During data collection, staff members who wanted to share their input but were ineligible for this study approached me. Expanding the participant class to include all employees could bring additional perspective to these results.

The selection of the qualitative, explorative case study method and design was influenced in part by existing quantitative data collected within the selected organization. The qualitative data collected in this study was useful to add perspective to the existing data which indicated safety improved. While useful as independent research projects, a

mixed method study combining qualitative and quantitative data may enhance the findings in this study. A mixed method study may also be used to enhance education and training programs at the research site and in other organizations.

An explorative single case study design was used to explore how a single organization improved safety through an organizational transition toward reliability. A multiple case study could be effective in determining which elements of HRO theory are effective in multiple organizations. A multiple case study would contribute to the generalizability of the findings, and enhance the qualitative data in this study the same way that empirical studies are enhanced through repetition (Yin, 2012).

An ethnographic study may also be useful in understanding the safety culture within the target organization. Findings in this study indicated that participants use similar language, and shared a similar change in job duties, responsibilities, and perceptions of the organization. These shared experiences could be further explored in an ethnographic study.

The empowerment of staff to make decisions without the immediate supervision of a physician is new to healthcare. Additional research that explores how staff makes important care decisions without freelancing may further support changes in the healthcare industry. Understanding the authority dynamic between the physicians and nursing and respiratory staff could contribute to better patient care.

Reflections

The goal for this qualitative, explorative, single case study was to understand how the nursing and respiratory staff experienced and contributed to the organizational

transition toward reliability. I was familiar with the management's role in the transition, and felt that this study could contribute to understanding the successful transition and subsequent improvements in patient safety. Assumptions and biases were identified early in the design process to enhance my ability to report objectively on the data collected through participant interviews.

I identified these four assumptions: (a) the participant would be able to recall participation in the organizational transition, (b) the participant would perceive this transition as positive, (c) the current organizational culture would reflect continued movement toward reliability, and (d) participants would provide open and honest responses to the interview questions. Most of the participants were able to recall participation in the organizational transition. A few questions were skipped due to a gap in participant recollection, but the majority of the questions were answered by all of the participants. All of the participants viewed the organizational transition as a positive change. The organization appears to be continually moving toward reliability, but some of the participants indicated there is a need to refresh some of the policies that have waned in the years since the transition. Participants suggested that the organizational leaders should enhance the educational and training programs to remind staff about HRO, and how it contributes to the safety of the staff and patients. The participants did provide open responses to the interview questions. Only the participants know how honest the responses were, but there is no indication the participants were anything but forthcoming in their responses.

I anticipated most of the responses on safety culture would center on patient safety. There were a number of staff safety concerns previously unknown to me. This unexpected insight contributed significantly to this study because the staff perceptions of the organization and their jobs were affected positively when these issues were addressed by the management.

Summary and Study Conclusions

The qualitative, explorative single case study was useful in exploring how the perceptions and experiences of nursing and respiratory staff affected the successful transition of a healthcare organization into a reliability-seeking organization. I used interviews, document reviews, and group observations to determine how the staff perceived the transition, and how their active participation and positive attitudes affected the transition process. These triangulated data sources were used to enhance the validity of the study.

The findings in this study were in alignment with the literature review, and add to the literature in the field of healthcare and patient safety. Transitioning to a reliability-seeking organization contributes to a reduction in safety incidents, improves staff perceptions of the organization, and reduces costs attributed to unsafe care. One recommendation based on the outcome of this study is that management should continue to promote HRO theory to the staff, and increase the training and educational opportunities for staff. Another recommendation is that organizational leadership reviews the current physician-staff hierarchy and renew some of the empowerment and decision-making authority of the staff that has waned over time.

Patient safety errors are costly to the patient and to the organization treating the patient. Regulations have not been effective in reducing errors thus far, and change is needed. Transitioning to a reliability-seeking organization will contribute to improved reporting to regulatory entities, enhance the safety of staff and patients, contribute to staff loyalty, and reduce operational and punitive costs.

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Appendix A: Permission to Conduct Research

August 19, 2013

To Whom It May Concern:

By this letter we are authorizing Jared Padgett to conduct research, as it relates to the study of High Reliability Organization culture and patient safety, in any and all facilities of our company. It is anticipated that the activities of this research will include interviews, shadowing of staff, and document review. We understand that the interviews will be conducted one on one, and may be conducted during business hours. We further understand that shadowing will take place during a minimum of four 30-minute sessions occurring at shift change, clinical rounds, and in the regular course of operation. Documents available for review include prior internal research, our Policy & Procedure manual, statistical information regarding 911 emergency calls and hospital transfers, and training materials. We understand that the study will not require analysis of protected health information, and materials provided for review will be de-identified as necessary in compliance with HIPAA and any other applicable regulations.

We agree to participate and cooperate in the selection of interview participants as needed, in order to meet the purposeful criterion sampling required for this study. We have been provided with information about the study and have become familiar with the scope and nature of his research, and hereby agree to our cooperation and involvement.

Respectfully,

[redacted]

President & CEO

[redacted]

Vice President of Human Resources and Corporate Services

Appendix B: Informed Consent Form

CONSENT FORM

You are invited to take part in a research study on how the implementation of High Reliability Organization (HRO) theory in an organization is experienced by the direct care staff of a healthcare organization. HRO theory explores how organizations that operate at high levels of risk seldom experience accidents. The researcher is inviting respiratory and nursing staff members who were employed at the facility before HRO theory was implemented and participated in the transition process. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Jared Padgett, who is a doctoral student at Walden University. You may remember Jared as a former employee in your organization. This study will be conducted within the context of his new role as a student researcher, and your participation is completely voluntary.

Background Information:
The purpose of this study is to learn how the perceptions and experiences of care staff affected the transition of the organization toward reliability to help other organizations conduct similar transitions to improve patient safety.

Procedures:
If you agree to be in this study, you will be asked to:

- Participate in a single interview, which will take about one hour to complete.
- Agree to be audio recorded during the interview for the purpose of transcription and to ensuring accuracy of the information to be analyzed.
- Review and comment on a collective summary of the interviews to ensure the accuracy of the information.

Sample Questions:
The following types of questions will be asked during the interview:

1.) What was the safety culture like at the organization before HRO was introduced?

2.) Describe the current safety culture in the organization.

3.) How did you perceive your role in the safety of your patients before learning about HRO?

Voluntary Nature of the Study:
Participating in this study is voluntary. Everyone will respect your decision to participate in this study or to decline to participate. No one at Walden University or at your organization will treat you differently if you decide not to participate in the study. If you decide to join the study now, you can still change your mind later. You may stop participating at any time.

Risks and Benefits of Being in the Study:
Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as fatigue or stress. The interview will be kept as brief as possible to reduce the potential for fatigue or stress, and should take up to one hour to complete. Participating in this study will not pose a risk to your safety or wellbeing. Your answers will remain confidential, and any information provided to the organization will exclude your personal information. Interview data will remain confidential and will not be traced back to you.

This study has the potential to benefit patients in other healthcare organizations, by providing insight into how the staff perceive and experience organizational changes to improve patient safety. The study may also benefit your organization. The results may be used for training new team members, and indicate any needed improvement in organizational policies and best practices.

Payment:
Participants in this study will not receive compensation for participating in this study.

Privacy:
Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. The researcher will not include your name or anything else that could identify you in the study reports or in the data presented to the organization. Data will be kept secure by storing hard copies in a locked container, and storing electronic data in an encrypted folder on a password-protected computer. Data will be kept for a period of at least 5 years as required by the university.

Contacts and Questions:
You may ask any questions you have now. If you have questions later, you may contact the researcher by phone at [redacted] or by email at [redacted] If you want to talk privately about your rights as a participant, you may call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is [redacted] Walden University's approval number for this study is 10-03-13-0313263, and it expires on October 2, 2014.

The researcher will give you a copy of this form to keep.

Statement of Consent:

I have read the above information, and I feel I understand the study well enough to make a decision about my involvement. By signing below, I understand that I am agreeing to the terms described above.

Printed Name of Participant _____

Date of consent _____

Participant's Signature _____

Researcher's Signature _____

Appendix C: Observation Guide

Observe groups of nursing and respiratory staff. Do not collect identifiable information. HRO concepts to be observed include: (a) developing and maintaining standard processes, (b) implementing checks and redundancy to mitigate potential failure, (c) authority migration, and (d) developing teams that openly communicate about failure to prevent recurrence of unsafe incidents. This guide should be used as a point of reference when engaging in group observation of the nursing and respiratory staff.

Observation Guide

Maintaining Standard Processes. Observe group rounds and shift changes in which nursing and respiratory staff participate. Is it apparent that standard processes are in place? Does the nursing and respiratory staff exhibit similar behavior, or is there variance?

Checks and Redundancy. Is there a checklist or is other documentation used in the care of the patient? Is this checklist consistently used?

Authority Migration. Was there an incident requiring an immediate change to patient care where a physician or manager was not required? Changes might include adjustments to ventilator settings.

Open Communication. Do nursing and respiratory staff openly communicate with each other? If an incident occurs during observation, how is this communicated?

Other. Note any additional observations that may be relevant in the improvement of patient care.

Appendix D: Explorative Single Case Study Participants

Participant Identification	Department	Years of Employment
Participant 1	Nursing	14
Participant 2	Nursing	15
Participant 3	Respiratory	12
Participant 4	Nursing	13
Participant 5	Respiratory	16
Participant 6	Respiratory	23
Participant 7	Nursing	19
Participant 8	Nursing	17
Participant 9	Respiratory	14
Participant 10	Respiratory	16
Participant 11	Nursing	17
Participant 12	Respiratory	18
Participant 13	Nursing	17
Participant 14	Nursing	15

Appendix E: Explorative Single Case Study Documents

Document Identification	Description
Document 1	Policy & Procedure (P&P) Manual: Multiple volume set of organizational policies and procedures
Document 2	P&P: Acute Fall Assessment Tool
Document 3	P&P: Adverse Drug Reaction
Document 4	P&P: Bedside Swallow Eval
Document 5	P&P: Chain of Command
Document 6	P&P: Change of Status
Document 7	P&P: Culture of Safety and Quality
Document 8	P&P: Infection Control
Document 9	P&P: Medical Emergency Response Team
Document 10	P&P: Pain Assessment & Management
Document 11	P&P: Patient Ventilator Management/Monitoring
Document 12	P&P: Preventative Maintenance – Risk Management - Safety
Document 13	P&P: Root Cause Analysis and Action Plan in Response to a Sentinel Event
Document 14	P&P: Safety Management Plan
Document 15	P&P: Safety Management Program – Responsibilities
Document 16	P&P: STAT CART Check List AM/NOC shift
Document 17	P&P: Unacceptable Abbreviations
Document 18	Pediatric Subacute Care: Supporting the Development of the Child Dependent on Life-Sustaining Technology: Collection of internal facility research

Appendix F: Explorative Single Case Study Code Book

Code	Example or Description	Total Count
HRO COMPONENTS	Category of codes describing components of HRO theory useful in reducing risks (Research Subquestion 1)	0
Pol_Policies		0
Pol_Lifting & Transfers	Minimum staffing requirements for lifting	14
Pol_Stay in Room	Someone always in the room	10
Pol_Infection Control	Fixing infection control issues	8
Pol_Strict Adherence	Rules applied more	8
Pol_Showers & Bathing	Two people give showers to improve incident management	7
Pol_Bed Rails Up	Bed rails up all the time	4
Pol_Forms & Checklists	Five point exam	4
Pol_Get Help	Okay to ask for help	3
Pol_HRO Already in Place	HRO already in place	2
Pol_Smoke Free Campus	No smoking on campus	2
Pol_Native Languages	Spoke in native languages (made staff and families uncomfortable)	1
Pat_Patient Care Improvements	Patient care improved immensely	2
Pat_Awareness	More awareness of safety issues	8
Pat_Fewer Incidents	Fewer STAT calls	8
Pat_Infection Control	Fixing infection control issues	8
Pat_Equipment	Apnea monitor on at all times	5
Pat_Early Interventions	Getting to emergency before it becomes an emergency	3
Pat_HRO Helpful	100% influence	3
Pat_Safer Now	Residents safer	3
Pat_Attentive to Patient	Pay more attention to patients	2
Pat_Better Care	They get better care	2
Pat_Careful	More careful	2
Pat_Culture	Different culture you get used to	2
Pat_Faster Response	Faster response to patient condition	2
Pat_Innovative Care	Kept patients that would have gone out	2
Pat_No Pain	Now they are lifted right and avoiding pain	2
Pat_Provide Best Care	Always try to provide best care possible	1
Edu_Education & Training		0
Edu_In-Services	In-Services as a reminder	4

(table continues)

Code	Example	Total Count
Edu_Train Staff	Make sure staff is trained	3
Edu_Cross-training	Nurses cross-trained	2
Edu_Demonstrations	Educate on equipment	2
Edu_Knowledge Base	Use knowledge base	2
Edu_Preceptor	Preceptor implemented	2
Edu_Better Information	Information for better assessments	1
Edu_Challenges	Education less a priority now	1
Edu_Clinical Rounds	Doctor gave lectures during clinical rounds	1
Edu_Equipment	Education on machines	1
Edu_Fundamentals of Risk	Need to know fundamentals of risk	1
Edu_Infection Control	Need to know cause of infections	1
Edu_Intensive Training	Training process more intense	1
Edu_More Now	More education	1
Edu_Peer Training	Staff should train other staff	1
Edu_Practice & Simulations	Practice and feeling comfortable	1
Edu_Refreshers	Reminder of basics	1
Edu_Understand Safety	More understanding of safety	1
Edu_White Board	Education at whiteboard	1
Sta_Staff Improvements		0
Sta_Empowerment	Gave staff more flexibility in patient care	8
Sta_Working Conditions	Better working conditions	4
Sta_Fewer Injuries	Nurses have fewer injuries	2
Sta_Safety Incentive	Safety incentive helps	2
Sta_Enjoy Working	Staff love working here	1
Sta_Longevity	Most staff here 10+ years	1
Sta_No Blaming	Don't rush to blame individual	1
Sta_Role in Safety	Staff plays important part in maintaining safety	1
Sta_Staff Comfortable with Patients & Technologies	More comfortable with kids and their disease process	1
QOL_Quality of Life		0
QOL_Comfortable	More comfort	2
QOL_Confident in Caregivers	Multiple people moving and using hoyer lift puts mind at ease	2
QOL_Field Trips & Outings	Take kids on outings to theme parks, zoo, aquarium, school	2
QOL_Improved life	Improved their life	2
QOL_Innovative Care	Used smell to help swallow	2
QOL_Feel Cared For	Patients feel like staff cares	1

(table continues)

Code	Example	Total Count
QOL_Feel Safer	Patients feel safer	1
QOL_Healthier	Kept kids healthier through early interventions	1
QOL_Patients Happy	Kids are happy	1
QOL_Patients Play	They play	1
QOL_Patients Smile	Recorded smiles in a study	1
QOL_Staff Plays with Patients	Employees play with patients	1
Saf_Safety		0
Saf_Always Safe	Always pretty safe	4
Saf_Safer now	Very safe	3
Saf_Can Always Improve	Always techniques to be more safe	1
Saf_Facility Security	Increased security guard presence at night	1
Saf_Preventable Conditions	Preventable neck irritations	1
Saf_Safety First	Safety first	1
Com_ Communication		0
Com_White Board	Communication at the white board	4
Com_Ask for Input	Get input from staff	3
Com_Better Information	Better information helps	2
Com_Meetings	Policy gone over during staff meetings	2
Com_With Staff	Aware of need for communication with staff	2
Com_Departmental	More communication between departments	1
Com_Policies Posted	New policies posted on board	1
Com_Reporting	Managers encourage reporting immediately	1
Com_With Managers	Staff communicating break times	1
Com_Policy Changes	Communicate about changes	1
Tea_Teamwork		0
Tea_Buddies	Working together as buddies	3
Tea_More Now	Working more as a team	3
Tea_Was Less	Less teamwork	2
Tea_Managers Available	Available to staff 24/7 for any issues	1
Tea_Peer Support	Having each other's back	1
Tea_Assigned Teams	Nurse, CNA, RT assigned to every patient in the room	1
Tea_Team Effort	Team effort	1
Ris_Risk Mitigation		0
Ris_Hazard Awareness	Cords not across floor	6
Ris_Equipment	Test before using on a patient	1

(table continues)

Code	Example	Total Count
PARTICIPANT CONTRIBUTION	Category of codes describing how participants contributed to success of organizational transition (Research Subquestion 2)	0
Com_Communication		0
Com_Share Information	Pass information along to colleagues	6
Com_Departmental	Nurses and RTs need to communicate	4
Com_Reporting	Form prompted better reporting	4
Com_White Board	New issues shared at the white board	3
Com_Good	Good communication	2
Com_Important	Communication is important	2
Com_Improved	Improved a lot	2
Com_Meetings	Participated in day meetings to contribute to night shift	2
Com_Staff encouraged to communicate	Encouraged to communicate	2
Com_Approachable managers	Approachability of managers influences	1
Com_Ask questions	Ask questions	1
Com_Asked for input	Staff concern forms	1
Com_Better between shifts	Better communication between AM and NOC	1
Com_Can improve	Can improve more	1
Com_Discover & address issues	Can address issues right away	1
Com_Faster	Faster communication	1
Com_Importance of safety	Talk about safety issues on the floor and importance of safety	1
Com_Lifting	Communicate when lifting	1
Com_Manager role	Department communication relies on people in management positions	1
Com_More verbal	Everybody's more verbal	1
Com_Poor before	Poorer communication	1
Com_Reminders	Remind staff of duties	1
Com_With doctors	Meetings in the room with doctors	1
Tea_Teamwork		0
Tea_Departmental	RTs became part of the team	6
Tea_Work together	Work together	5
Tea_Divided	Departments divided among themselves	4
Tea_Managers helpful	Charge nurses and managers helped more	4
Tea_Always good	Always been a pretty good team	3

(table continues)

Code	Example	Total Count
Tea_Roles understood & respected	Everybody more aware of their part in HR[O]	2
Tea_Not good before	Teamwork not as good	1
Tea_All work for patient	All work for patient	1
Tea_Ask for help	Always ask for help	1
Tea_Available	More available on the floor	1
Tea_Benefits patient	It’s all beneficial for the child	1
Tea_Collaborative reporting	Collaborative reporting	1
Tea_Confident in team	Not worried about peers doing job correctly	1
Tea_Cooperation	CRAWL process starts with cooperate	1
Tea_Culture	More of one mind	1
Tea_Everyone can participate	Everyone can participate in safety	1
Tea_Got more help	Got more help	1
Tea_More now	More team work	1
Tea_With doctors	Interactions with doctors improved	1
HRO_HRO Beneficial		0
HRO_Can prevent incidents	Incidents may occur without HRO	2
HRO_Open mind	Have an open mind	2
HRO_Applicable to daily life	Can use HRO in everyday life	1
HRO_Awareness	Need to be aware at all times	1
HRO_Beneficial	Definitely beneficial	1
HRO_Different than school	Approach we use is different from what you learn in school	1
HRO_Embrace it	Embrace it	1
HRO_For resident & staff good	For the residents' and staff good	1
HRO_Good experience	They'd have a good experience	1
HRO_Important to apply	It's important to apply	1
HRO_Let me prove it works	Let me prove it to you that this does work	1
HRO_New approach to care	This is an approach you haven't learned	1
HRO_Nothing negative	Haven't seen anything negative come out of it	1
HRO_Try it	Try it	1
HRO_Why we're safe	HRO is why we're safe	1
HRO_Willing to learn	Be willing to learn about it	1
Sta_Staff Improvements		0

(table continues)

Code	Example	Total Count
Sta_Empowerment	Doctors acknowledged what staff said	3
Sta_Relationships	Relationships improved	2
Sta_All on same page	All on the same page	1
Sta_Approach to care different	Approach to the patient is different	1
Sta_Avoid injuries	Avoid injuries through bad lifting	1
Sta_Awareness of safety	Awareness of safety	1
Sta_Better focus	Better focus	1
Sta_Comfortable with doctors	Staff comfortable with the doctors	1
Sta_Comfortable with management	More comfortable with management	1
Sta_Culture	A thinking culture	1
Sta_Encouraged to be professional	Always encouraged to be professional	1
Sta_Focus on safety	Focus on safety and environment	1
Sta_Organized	More organized	1
Sta_Part of a team	Felt more a part of the team	1
Sta_Working conditions	More equipment on the floor	1
Edu_Education & Training		0
Edu_Knowledge base	Learn from mistakes	4
Edu_Change together	Departments change together	1
Edu_Competencies	Competencies on equipment and procedures	1
Edu_Continuous education	Need constant in-servicing	1
Edu_Important	Education is important	1
Edu_In-Services	In-services about safety	1
Edu_Learn & grow together	Grew together	1
Edu_Learn as much as possible	Learn as much as possible	1
Edu_Manage time	Manage time wisely	1
Edu_White board mini in-service	Whiteboard as mini in-service	1
Edu_Will use training on floor	They'll need the training on the floor	1
Pat_Patient Care Improvements		0
Pat_Awareness	Everybody was watching	5
Pat_Better outcomes	We've had really good outcomes	2
Pat_Response times	Faster interventions	2

(table continues)

Code	Example	Total Count
Pat_Careful	Remember it's good to be more careful	1
Pat_Early interventions	Early interventions	1
Pat_Learn patient norms	Get to know your patients and their norms	1
Pol_Policies		0
Pol_Forms & Checklists	Checkout list throughout night	2
Pol_More strict	More enforcement of policy	2
Pol_Enforce Policies	Set policies and enforce them	1
Pol_Follow policies	Follow the policies	1
Pol_Lifting & transfers	Hoyer lift helps	1
Saf_Safety		0
Saf_Safer	Can always be safer	1
Saf_Safety first	Safety First	1
PRACTITIONER ATTITUDES	SQ3	0
Sta_Staff Improvements		0
Sta_Empowered	Took ownership of decisions	7
Sta_Fewer injuries	Employees don't hurt back	3
Sta_Proud to work	People proud to work here	3
Sta_Lower stress	Less stress	2
Sta_Available	Being available	1
Sta_Aware of roles	More aware of roles	1
Sta_Became a culture	Became a culture	1
Sta_Confident in patient care	Know the children are taken care of	1
Sta_Look after each other	Look after each other	1
Sta_More tools available	More tools to work with	1
Sta_Regular breaks encouraged	Avoid staff fatigue by encouraging breaks	1
Imp _Implementation Improvements		0
Imp_Education & Training	More classes with the right people and the right incidents	6
Imp_Managed well	Managed well	5
Imp_Managers more available	Management was on floor talking and listening to staff	5
Imp_More communication	Talk more about it at staff meetings	2
Imp_Enforce policies	Continue enforcing policy	1
Job_ Job Perception		0
Job_Felt good about job	Felt like role was important	3

(table continues)

Code	Example	Total Count
Job_Fewer incidents	Know fewer STAT calls or CPR needed	3
Job_Can work with team for safe care	Work together for kids' safety	2
Job_Changes benefited patients	Residents were number 1 priority	2
Job_Empowered	Trust was a big factor	2
Job_Secure	Felt secure	2
Job_Exciting	Made job more exciting	1
Job_Good care takes longer	Some things took longer to do	1
Job_Safety number 1	Safety is the job	1
Per_Perception of organization		0
Per_Safety number 1	Safety number one goal	6
Per_Facility is safer	Facility is safer	3
Per_Positive perception of organization	Positive	3
Per_Family rather than business	More like a family not a business	1
Per_Leader in field (trained others)	Trained other universities	1
Per_Managers supported staff	[Managers] were here to support us	1
Per_Residents taken care of	Main goal taking care of the child	1
Per_Thought about where organization was going	Thought about where organization was going	1
Saf_Safety		0
Saf_Safety number 1	Safety number one	10
Saf_Focused on routine care before	Changed trachs	5
Saf_Mistakes affect patients	Mistakes affect patient's life	1
Edu_Education & Training		0
Edu_In-services	In-serviced a lot	3
Edu_Continual Training	Ongoing training	2
Edu_Physician involved	Doctor did education on the floor	2
Edu_Trainers	Managers did teaching themselves	2
Edu_Knowledge base	Learn from mistakes	2

(table continues)

Code	Example	Total Count
Edu_Improve without blaming	Encourage staff improvement without finger pointing	1
Edu_Train new staff	Need to make sure all new staff is trained	1
Edu_Protocols updated	Yearly protocols	1
Pat_Patient Care Improvements		0
Pat_Good Care	Got good care	4
Pat_Attentive	More attentive to patient	4
Pat_Early responses	Catch things fast	2
Pat_Aware of surroundings	Aware of surroundings	1
Pat_Careful	Slowing down to be careful	1
Pat_Fewer injuries	Residents aren't hurt	1
Man_Management Handling		0
Man_Handled Well	Good job implementing and seeing it through	4
Man_Managers have faith HRO works	They have faith that it does work	1
Man_Managers want staff to use HRO	They would like us to use HRO	1
Man_Policies enforced	Made and enforced policies	1
Man_Stuck to the plan	Following the plan	1
Man_Managers wanted patients to be safe	Wanted to keep the residents safe	1
Com_Communication		0
Com_Reporting	Emphasis on reporting	5
Com_Good communication	Good communication	1
Com_Feedback	Gave suggestions for care, open to suggestions	1
Com_With each other	Communicate with each other	1
Pol_Policies		0
Pol_Lifting & Transfers	Use hoyer lift to prevent injuries	4
Pol_Bathing & Showers	Bath buddy, someone always with the patient	2
Pol_Stay in the room	Stay in the room	1
Pol_Weight limits	Weight limits not emphasized [before]	1
Tea_Teamwork		0
Tea_Work together	Working together as a team	4
Tea_Departmental	Involvement of other departments helped	2

(table continues)

Code	Example	Total Count
Tea_Helping one another	Make sure other [patients] are safe in different rooms also	2
BUSINESS APPLICATION	Codes that correspond with application to business practice	0
Pat_Patient Retention		0
Pat_Sending out	Not sending residents out to ER	5
Pat_In-house treatments	Took care of patients here (in the facility)	2
FewI_Fewer Incidents		0
FewI_Fewer Accidents	Lifting accidents reduced	2
FewI_Incidents decreased	Incidents decreased	1
FewI_Fewer staff injuries	[Employees] not sent to clinic	1
Equ_Equipment		0
Equ_Maintained	Equipment issues reported to maintenance	2
Equ_More and Better	Purchase more and better equipment	2
FewS_Fewer supplies	Use fewer medical supplies	4
Red_Reduced Lab Work		0
Red_Visual assessments	Ventilators managed without blood gasses	3
PatCar_Patient Care Improvements	Improvements in patient care	0
PatCar_Early Response	Early response	1
PatCar_Engaged with patients	Stay engaged with patient	1
PatCar_Environment changed	Environment has changed	1
PatCar_Time savings	Less time spent on preventable illness	1
IN VIVO CODES	Codes corresponding to frequently used words or terms	0
Teamwork		20
Lifting		14
Awareness		14
Communication		14
Bathing/Showers		11
Stay in Room		10
White Board		10
Hoyer Lift		9
In-services		9

(table continues)

Code	Example	Total Count
Send Out		7
Transferring		7
Buddies		6
STAT calls		6
Not as Strict		3
Have each other's back		2

Curriculum Vitae

JARED D. PADGETT

EDUCATION

Doctor of Business Administration, *Specialization in Leadership* *June, 2014*
Walden University, *Minneapolis, MN*

Master of Business Administration, *Information Technology* *May, 2011*
Western International University, *Phoenix, AZ*

Bachelor of Arts, *Religion* *April, 2001*
Pepperdine University, *Malibu, CA*

MEMBERSHIPS

Delta Mu Delta
International Honor Society in Business Administration

Upsilon Pi Epsilon
International Honor Society for the Computing and Information Disciplines

Golden Key International Honour Society

PROFESSIONAL EXPERIENCE

Pepperdine University School of Law, *Malibu, CA* *September 2007 – Present*
Manager of Web Development & Digital Media

Currently supervising website and digital signage teams, known for efficiency and quality of service. Duties include management of Apache web servers, MS SQL databases, WordPress blogs, content management systems, and other web services. Managed event websites, registrations, and online payment tools. Social media achievements include development and maintenance of Facebook fan pages, Twitter, and Google+ business pages. I develop policies for websites and digital signage, and develop cross-platform marketing campaigns and participate in events planning for major campus events. I provide IT support for students, faculty, and staff as needed.

Achievements:

- Facebook fan page currently has over 2,800 likes
- Developed and published over 1,200 digital signage ads since 2008
- Primary website received over 1 million page views in fiscal year 2013

[redacted] *December 2002 – September 2007*
Corporate Services Analyst

Developed and maintained web presence for corporate facilities. Co-authored and coordinated team efforts on facility research projects designed to improve patient care. Supported business development projects. Maintained research database in MS Access. Provided IT and administrative support for corporate offices.

Achievements:

- Co-organized the first two international conferences for High Reliability Organizations
- Maintained team Institutional Research Board (IRB) credentialing and compliance
- Led or contributed to eight research posters which were presented at care practitioner, physician, and healthcare administration conferences

CERTIFICATIONS

Digital Signage Network Expert (DSNE) *September, 2011*
Digital Signage Experts Group

Digital Signage Certified Expert (DSCE) *March, 2009*
Digital Signage Experts Group

PRESENTATIONS AND PUBLICATIONS

Padgett, J. (2013, February). *Optimizing Content for an Academic Audience***.** Presented at the Digital Signage Expo, Las Vegas, NV.

Padgett, J. (2013, February). *Planning for success: The value of building a digital signage team*. Presented at the Digital Signage Expo, Las Vegas, NV

Padgett, J. (2012, June). *WordPress as a CMS: Implementation and Customization***.** Presented at the CALI Conference, San Diego, CA.

Padgett, J. (2012, March). *Digital signage as a mobile call to action***.** Presented at the Digital Signage Expo, Las Vegas, NV.

Padgett, J. (2011). How to engage a higher ed audience beyond the digital screen. *eCampus News*, Bethesda, MD.

CO-AUTHORED POSTER PRESENTATIONS

Calderon, R., Davenport, C., Clements, P., Padgett, J., Kausen, B., & van Stralen, D. (2006, July). *RCP culture of high reliability facilitates initiation of mechanical ventilation*. Poster presented at the California Society for Respiratory Care Conference, Rancho Mirage, CA.

Davenport, C., Calderon, R., Clements, P., Padgett, J., Kausen, B., van Stralen, D., Daniel, A., & Rao, R. (2006, July). *How RCPs Use the Boyd OODA loop to initiate mechanical ventilation in tracheostomy-dependent patients in a subacute care facility*. Poster presented at the California Society for Respiratory Care Conference, Rancho Mirage, CA.

van Stralen, D., Calderon, R., Clements, P., Kausen, B., Padgett, J., Daniel, A., & Rao, R. (2006, March). *Use of the Boyd OODA loop to initiate mechanical ventilation (IMV) in a chronic intensive care nursing home*. Poster Presented at the 29th Annual American Medical Directors Association (AMDA) Symposium, Dallas, TX.

van Stralen, D., Calderon, R., Padgett, J., Clements, P., Lawson, E., Daniel, A., Rao, R., & Eachus, T. (2006, March). *Smile and laughter during mechanical ventilation in children*. Poster presented at the 29th Annual American Medical Directors Association (AMDA) Symposium, Dallas, TX.

van Stralen, D., Calderon, R., Clements, P., Daniel, A., Rao, R., Padgett, J., Kausen, B., & Roberts, K. (2006, January). *High reliability organization methods facilitate initiation of mechanical ventilation in a pediatric nursing home*. Poster presented at the Society of Critical Care Medicine's 35th Critical Care Conference, San Francisco, CA.

van Stralen, D., Sorensen, D., Clements, P., Calderon, R., Padgett, J., Klein, S., King, P., Daniel, A., & Rao, R. (2005, April). *Fluid bolus therapy to treat thick secretions in ventilator-dependent children*. Poster presented at the 10h Annual JIVD Conference, Lyon, France.

van Stralen, D., Clements, P., Calderon, R., Padgett, J., Meissner, L., & Rao, R. (2005, April). *Use of a clinical respiratory exam to adjust ventilators in ventilator-dependent children*. Poster presented at the 10h Annual JIVD Conference, Lyon, France.

Klein, S., Dopp, N., Eachus, T., King, P., Mikov, T, Daniel, A., Rao, R., Padgett, J., Meissner, L., Carter, A., Hill, R., Honrada, M., & van Stralen, D. (2003, March). *Smiling as an indicator of growth and development in profoundly disabled children*. Poster presented at the 26th Annual American Medical Directors Association (AMDA) Symposium, Orlando, FL.

CO-ORGANIZED ACADEMIC CONFERENCES

Grouping for solutions: Increasing organizational reliability by bringing academicians and practitioners together, (2006, April). HRO 2nd Year Conference, Ontario, CA.

Getting it right: Solving the unsolvable (with duty to act), (2003, August). HRO First Year Conference, Yucaipa, CA.