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Getting to Zero Preventable Falls: An Exploratory Study

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Getting to Zero Preventable Falls: An Exploratory Study

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University

By

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I dedicate this dissertation in honor of my mom who has been the anchor of my life and my dad who inspired me to pursue a doctorate degree.

A special dedication to George, Wesley, Jake, and Gracie for being part of my life.

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TABLE OF CONTENTS

List of Tables

List of Figures

Abstract

GETTING TO ZERO PREVENTABLE FALLS: AN EXPLORATORY STUDY

Kate Lim Bradshaw, Ph.D.

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

Virginia Commonwealth University, 2019

Committee Chair: Cheryl Rathert, PhD, Associate Professor, Health Administration

Objective: The objective of this study is to examine relations between patient safety culture and processes of care, specifically, how patient safety culture influences the prevention of patient falls. The purpose of this inquiry is to identify the barriers and facilitators that can advance an inpatient rehabilitation facility to become a high reliability organization and advance interdisciplinary teamwork.

Method: A qualitative phenomenological approach was conducted and an interpretive phenomenological analysis explored the experiences of frontline staff with regard to patient safety culture and fall prevention. The study utilized semi-structured interviews with 24 frontline staff from three inpatient rehabilitation hospitals. Participants were selected using purposive sampling and individually interviewed.

Results: Findings revealed barriers and facilitators for each dimension of patient safety culture that drive fall prevention. Teamwork within and across disciplines, such as between nursing and therapy, affect how they communicate with one another. Issues related to staffing were the most

common concerns amongst nursing staff; especially the issue of staffing ratio and patient acuity. Leadership played a role in supporting the culture of safety and holding staff accountable.

Conclusion: Fall prevention requires collaborative efforts between nursing and therapy in an inpatient rehabilitation setting. Dimensions of patient safety culture such as good teamwork, effective communication, adequate staffing, nonpunitive response to errors, and strong leadership support are essential in maintaining a high reliability process for adaptive learning and reliable performance.

Keywords: patient safety culture, fall prevention, dimensions of safety, interdisciplinary collaboration, teamwork, communication, staffing, leadership.

Chapter 1: Introduction and Purpose

Background Information

Patient falls are a leading threat to the safety of patients and present significant clinical, legal, and a regulatory problem for hospitals (Hempel et al., 2013). The Centers for Disease Control and Prevention (CDC) reported that American adults aged 65 and older are prone to falls, making falls the number one cause of injuries and accidental deaths in the United States (Heron, 2017). According to the National Vital Statistics Systems (NVSS), injuries from falls in the community and hospital settings accounted for more than half (55%) of all unintentional injury deaths among elderly adults in the year 2012-2013 (Kramarow, Chen, Hedegaard, & Warner, 2015). Healthy People 2020 found that hospital costs related to falls exceed $105.6 million each year and more than 80% of patients who had fallen at the hospital are unable to regain their functional status to live independently at home (New Hampshire Department of Health and Human Services, 2010). Hospitalized patients are also at a higher risk for falls due to being in unfamiliar surroundings and coping with changes in their physiological and cognitive functions (Stephenson et al., 2016). Patient falls while in the hospital generate a spiraling effect on patient length of stay, increased mortality and morbidity, and increased complications (Quigley, Barnett, Bulat, & Friedman, 2016).

Healthcare providers face considerable challenges in preventing patient falls across the care continuum from emergency rooms to hospitals to skilled nursing facilities. The first challenge is in defining and categorizing falls as it can vary and be subjective (Staggs & Dunton,

2014). For example, in psychiatric units a patient may intentionally fall, in neonatal units babies may be dropped while being transferred from one person to another, and in pediatric units, a toddler may fall as part of the normal developmental process (Staggs, Davidson, Dunton, & Crosser, 2015). Hence, a standard definition is necessary for consistency in reporting and measuring. Many hospitals adopt the definition from the National Database of Nursing Quality Indicators (NDNQI®) which defines a patient fall as "an unplanned descent to the floor (or extension of the floor, e.g., trash can or other equipment) with or without injury to the patient" (Garrard, Boyle, Simon, Dunton, & Gajewski, 2016, p.115). This dissertation will also use the same definition to be consistent with the hospital-setting. The next challenge is to determine the root causes of falls.

Although several factors have been implicated as causes of falls and injuries, there is no definitive predictor profile identified. A fall can be accidental, or it can be due to the patient's underlying physiological condition (Murphy & Quigley, 2015). However, the most common cause of morbidity and mortality is a result of the trauma from the fall itself (Currie, 2008). Many hospital systems, including the Veterans Affairs (VA) system, use fall categorization based on recommendations from Morse (2009). The following three categories are the major root causes of patient falls:

1) Accidental falls – "falls that occur due to extrinsic environmental risk factors or hazards,"
2) Anticipated physiological falls - "occur in patients whose score on the MFS [Morse Fall Scale] indicates that they are at risk of falling" and
3) Unanticipated physiological falls – "physical conditions that cannot be predicted until the patient falls" (Staggs et al., 2015, p.109).

The VA system created an algorithm as shown in Figure 1 below for healthcare leaders such as risk managers and unit nurse managers to assess if a fall is preventable based on the cause of fall and if all preventive steps have been taken prior to the fall (https://www.patientsafety.va.gov/professionals/onthejob/falls.asp.).

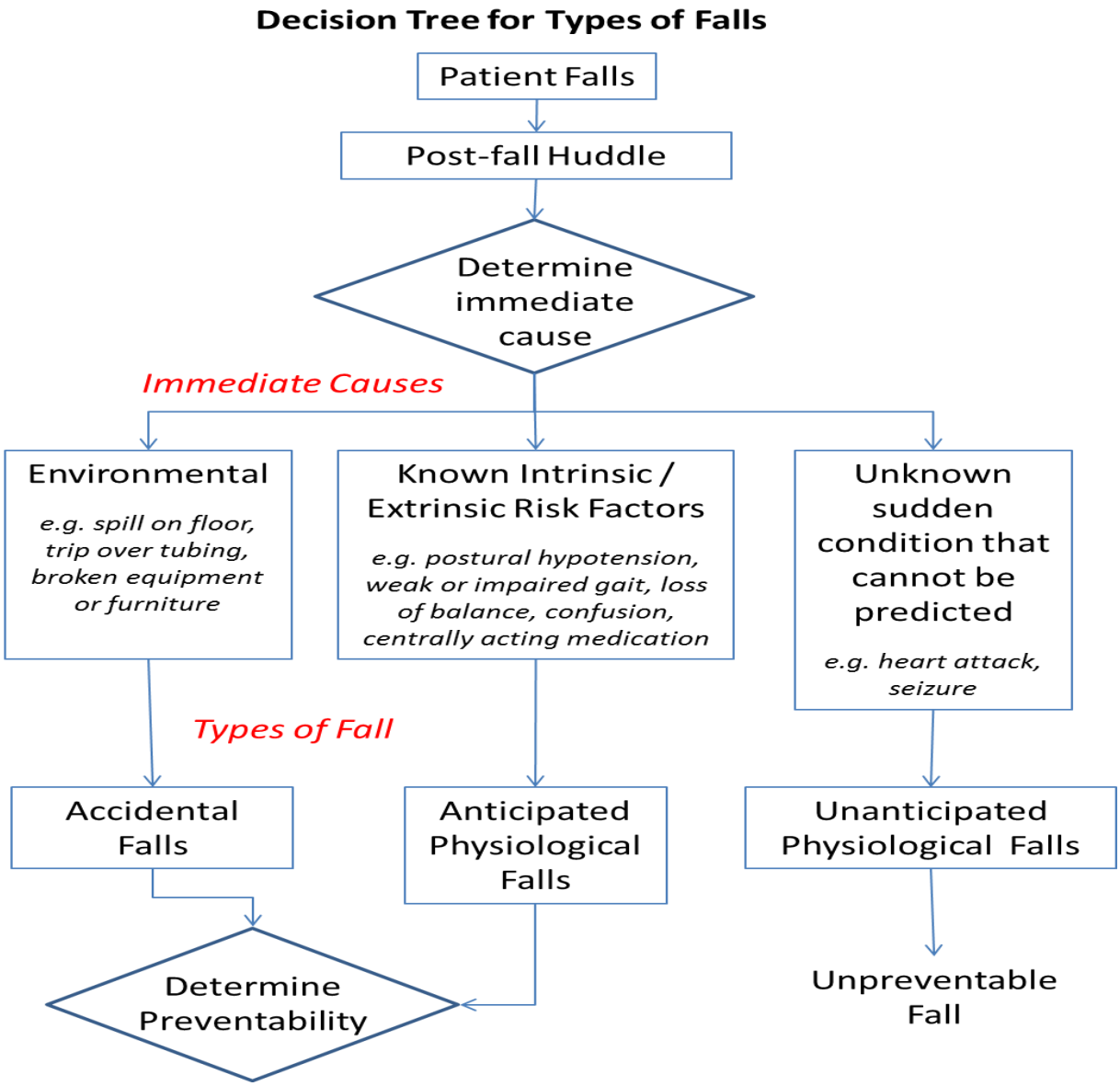

Figure 1. Decision tree for types of falls. Adapted from Agency for Healthcare Research and Quality (AHRQ) Module 3: Best Practices in Fall Prevention—Presentation Slide 43: Decision Tree for Types of Falls. Permission obtained from Patricia Quigley, PhD on August 13, 2019.

Hospitals generally collect statistics on inpatient falls and fall-related injury as a direct measure of patient safety and use the data for internal quality improvement purposes (https://www.ahrq.gov/professionals/systems/hospital/fallpxtoolkit/fallpxtk5.html). The National Quality Forum (NQF) established a standardized method to determine fall rates across a large number of hospitals which was adopted by the American Nurses Association in creating a benchmark for nursing quality (Garrard, Boyle, Simon, Dunton, & Gajewski, 2016). In 1997, the American Nurses Association (ANA) established the NDNQI® for quality improvement and research purposes (Walsh et al., 2018). Currently, around 1,500 hospitals voluntarily participate in submitting data to NDNQI® (Walsh et al., 2018). From the database, a prevalence rate of 3.56 per 1,000 patient days was established as a comparative benchmark for inpatient fall in acute care hospitals (Bouldin et al., 2013). The purpose of the benchmark is to compare the rate of patient falls from one hospital to another so that hospital leaders can gauge their improvement efforts in fall prevention. Patient fall rates vary substantially across different units with a rate of 1.3 per 1,000 patient days in Intensive Care Unit to 7.6 per 1,000 patient days in Rehabilitation Unit (Lake, Shang, Klaus, & Dunton, 2010). Approximately 25% of the falls result in injuries. The severity of the injuries is classified into the following categories: minor injury such as laceration; moderate injury such as hematoma; major injury such as a fracture or intracranial bleed; and death (Bouldin et al., 2013).

Healthcare administrators and third-party payers such as Medicare are concerned with the significant cost burden to the entire health care system when a patient falls while in the hospital, with injurious falls costing over $31 billion for Medicare alone in 2015 (Burns, Stevens, & Lee, 2016). Burns, Stevens, and Lee (2016) estimated an average cost of $25,487 per fatal fall and $9,463 for non-fatal fall. Elderly patients who fall are at risk of fractures, traumatic pain

syndromes, functional limitations, excess healthcare costs, and increased morbidity which inadvertently poses as a significant public health problem and economic burden for the patient and family (Alekna, Stukas, Tamulaityte-Morozoviene, Šurkiene, & Tamulaitiene, 2015). Moreover, Medicare no longer reimburses hospitals for increased costs due to injury from an inpatient fall (https://www.cms.gov/medicare/medicare-fee-for-service-payment/hospitalacqcond/hospital-acquired_conditions.html). Besides suffering from physical injury, patients who fell may suffer psychological consequences such as fear of falling and loss of confidence which in turn leads to a reduction in social activities (Breimaier, Halfens, & Lohrmann, 2015). These effects can be detrimental to the patient's independence and rehabilitation process (Miake-Lye, Hempel, Ganz, & Shekelle, 2013).

As a consequence, family and caregivers have to bear the burden of care post-hospitalization if the patient is not able to perform self-care due to the injuries (Pike et al., 2010). A study conducted between 2015 to 2017 found that the national estimate of the economic burden of informal caregiving associated with injurious falls is $9.6 billion whereas it costs $12 billion for falls with no injury due to the more substantial number of patients who do not suffer any injury (Joo, Wang, Yee, Zhang, & Sleet, 2017). Joo et al., (2017) found that patients who suffer fall-related injuries require more informal caregiving hours than those who do not experience any injury after falling. However, a majority of falls do not result in injury, and thus the national estimates for the total cost of informal caregiving are higher than those with fall-related injuries. This finding emphasizes the importance of developing strategies to prevent falls and fall-related injuries among elderly patients (Joo et al., 2017).

Problem Addressed in this Study

Delivering safe, effective and reliable care is the core responsibility of inpatient rehabilitation facilities (IRFs) specializing in providing intensive rehabilitation therapy to patients recovering from illness, injury, or surgery (Leone & Adams, 2016). IRFs specialize in providing intensive rehabilitation therapy to patients with stroke, neurological disorders, and major lower extremity joint replacements. Patients entering rehabilitation hospitals must be able to tolerate and benefit from at least 3 hours of therapy a day, five days a week (Centers for Medicare and Medicaid, 2012). Such stringent requirements present a dilemma for rehabilitation team members whose duties are to promote independence but also to prevent falls. Patients are advised to ask for assistance when getting out of bed, going to the bathroom, or transferring from wheelchair to bed, but they often do not heed the advice due to multiple factors such as underestimation of the risk of falling, impulsivity and impaired cognition (Bunn, Dickinson, Barnett-Page, McInnes, & Horton, 2008). Applying safety measures to prevent falls often entails restricting patient movement and thus decreases independence. The rehabilitation team, which typically consists of nurses, therapists, nursing technicians and rehabilitation technicians are expected to work efficiently as a team taking care of clusters of patients (Weil, 2015). Even though regulatory agencies expect each patient to receive an individualized plan of care, the rehabilitation team often deliver care in bundles, such as treating a group of patients with high fall risk using the same fall prevention strategies (Cox et al., 2015). In part, this is due to the need for efficiency but, it takes only a single gap in care, a moment of delay, and an ineffective handoff communication to create a perfect setting for a patient fall (Alverzo, 2016).

Despite efforts to have evidence-based protocols in place to prevent adverse events such as patient falls, medical errors continue to prevail and generate significant personal and financial

burdens. The Institute for Healthcare Improvement (IHI) defines an adverse event as "unintended physical injury resulting from or contributed to by medical care (including the absence of indicated medical treatment), that requires additional monitoring, treatment, or hospitalization, or that results in death" (Griffin & Resar, 2009, p.5). Among the adverse events, patient falls remain the predominant patient safety issue in IRF hospitals (Frisina, Guellnitz, & Alverzo, 2010; Teasell, McRae, Foley, & Bhardwaj, 2002). A sentinel event is defined as "a patient safety event (not primarily related to the natural course of the patient's illness or underlying condition) that reaches a patient and results in any of the following: death, permanent harm, or severe temporary harm" (The Joint Commission, 2017, p.1). The Joint Commission (2015) stated that one of the top 10 sentinel events is patient falls with serious injury, with a majority of them happening in the hospital setting. Out of those reported falls events, 63 percent of them resulted in death, while the remaining patients sustained severe injuries (The Joint Commission, 2015).

Due to the importance of fall prevention, many researchers have conducted extensive research on fall prevention tools, risk assessment, and evidence-based care for patients with specific diagnoses (Titler et al., 2016). Multiple disciplines and teams are actively engaged in fall prevention by adopting best practices in the field, yet preventable falls continue to occur. Leone and Adams (2016) conducted research linking safety culture to patient falls in IRF, and they found that the decrease in fall rate was associated with the initial revitalization of culture of safety through hourly rounding. The result of the study indicated initial success in implementing multiple interventions to prevent falls in addition to encouraging a positive shift in safety culture, but they were not able to sustain the improvement efforts over three years (Leone & Adams, 2016). Without a way to directly assess the organizational behavior that shapes the actions of frontline staff, healthcare researchers cannot ascertain the exact mechanism through which

leaders and other intervention strategies can reduce errors (Hempel et al., 2013). Thus, it is critically important for researchers to explore organizational behavior and learn about the human factors that can lead to adverse events such as patient falls.

On the other hand, it could be systems failures that cause human errors (Leape, 2015). Leape (2015) asserted that some systems are consciously designed for the convenience of the providers such as physicians and nurses or administrators, but not catered to the needs of the patients. If processes are not designed all the way to the patient, it is not surprising that such operations could lead to errors.

Patient Safety Culture

The Agency for Healthcare Research and Quality (AHRQ) describes the patient safety culture of an organization as "the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management" (Sorra, Gray, Streagle, & et al, 2016, p. 6). IRF patients may be put at risk of harm if the organization does not adopt a high-reliability patient safety culture (Kwan, Kaplan, Hudson-Mckinney, Redman-Bentley, & Rosario, 2012). Following the Institute of Medicine (IOM) report on "To Err is Human: Building a Safer Health System" (Kohn, Corrigan & Donaldson, 2000), preventable adverse events are still the third leading cause of death in the United States (Makary & Daniel, 2016). Many healthcare organizations have launched patient safety initiatives to prevent caregivers from committing errors or catch errors before they cause harm. The central themes of such initiatives are drawn from high-risk industries such as the nuclear industry that have impressive safety records (Wachter & Pronovost, 2009). Such industries can maintain high levels of safety while operating under hazardous conditions. The Joint Commission, an accrediting body for healthcare

industries, encourage hospitals and health systems to adopt and apply high-reliability science to reach levels of quality and safety that is comparable to those of the best high reliability organizations (Chassin & Loeb, 2013). This would be reflected in the patient safety culture.

Researchers have long studied and debated about the sources of medical errors that lead to adverse events and have searched for ways to improve patient safety (Goodman et al., 2011). Many organizations focus on the defects in the system that gives rise to errors by developing a "culture of safety" (Vogus & Sutcliffe, 2007). Healthcare organizations that adopt the best practices developed by researchers are still questioning why they are not successful in preventing errors (Vogus, Sutcliffe, & Weick, 2010). Adoption of best practices alone does not ensure high quality and consistent safety. Instead, healthcare organizations may want to consider organizational accidents as systems failure and how the organization can achieve high reliability by emphasizing trust, reporting unsafe conditions that test the limits of reliability, and continuously look for ways to improve quality rather than assigning blame (McGinnis, 2011).

The first critical step in making improvements in patient safety is to assess the status of the existing culture of patient safety in an organization and prioritize the areas that need improvement (Sorra & Dyer, 2010). Many hospitals and healthcare systems across the United States and several other countries use the AHRQ patient safety culture survey to study the relationship between patient safety culture and patient outcomes (Mardon, Khanna, Sorra, Dyer, & Famolaro, 2010). Patient safety culture is conceptualized using the following dimensions (from the staff perspective): communication openness, feedback and communication about errors, frequency of events reported, handoffs and transitions, management support for patient safety, non-punitive response to error, organizational learning, overall perceptions of patient

safety, staffing, supervisor/manager expectations and actions promoting safety, teamwork across units, and teamwork within units (Sorra & Nieva, 2004).

Fall Prevention Programs

Fall prevention programs have multiple components involving patient physiological conditions and environmental factors which can be complicated (Currie, 2008). Traditionally, fall prevention relies on nursing assessment, but an effective fall prevention program requires a multi-disciplinary approach and multi-factorial evaluation of the patient (Murphy & Quigley, 2015). A fall prevention program starts with nurses using evidence-based fall risk assessment tools such as Morse Fall Scale (Morse, 2009) or Hendrich Fall Risk Model (Hendrich, 2007) to determine a patient's fall risk level. These fall risk assessments tools can be an essential first step to prevention. The tools provide a scoring system based on patient's fall history, medications, underlying medical and psychological conditions, functional status tests, and environmental factors (Hendrich, 2007; Johnson, Kelly, Siric, Tran, & Overs, 2015; Morse, 2009). Based on the scores, nurses apply standard fall precautions such as non-skid socks, frequent toileting through hourly rounding, prompt call bell response, adequate lighting, and clutter-free environment (Hoke & Guarracino, 2016). Patients thought to be at a higher risk for falls are fitted with bed alarms and wheelchair alarms to alert the staff when patients are attempting to get up without assistance (Forrest, Chen, Huss, & Giesler, 2013). Depending on hospital policy, patients may wear a yellow armband or have a star on their doors to alert other clinicians in the care team such as physical therapists, occupational therapists, and radiology technicians. Nursing staff encourages family members to stay with patients and inform the staff when help is needed. Physical therapists and occupational therapists assess the patient's functional status such as gait, balance, and mobility to further recommend fall prevention tools such as gait belt and other

assistive devices (Murphy & Quigley, 2015). Physicians and pharmacists review patients' medications daily to minimize the use of narcotics, antipsychotic drugs, sedatives, and medications associated with orthostatic hypotension (Forrest et al., 2012).

When a patient falls despite these prevention efforts, the frontline staff can feel distressed and frustrated. Once a fall occurs, hospital leaders conduct post-fall huddles to determine the immediate root cause of falls such as environmental factors or patient characteristics and apply appropriate interventions to prevent future occurrences (Quigley et al., 2016). Such causal analyses in an attempt to understand whether a fall is preventable could have negative implications and ramifications for hospital staff members, who may perceive it as a blame game (Staggs & Dunton, 2014). When staff has a negative assumption or experiences about reporting an adverse event, they will tend not to report every incident. On the other hand, managers may feel that they have not put in an adequate control system to prevent falls. The effort of one single clinician cannot prevent falls. Fall prevention requires the active engagement of multiple disciplines and teams involved in caring for the patient (Groves, 2014); in other words, a patient safety culture. Successful implementation of the strategies to prevent falls depends on leadership commitment to safety and cooperation of multidisciplinary frontline staff (Hempel et al., 2013).

Present Study Aims and Objectives

This research aims to explore clinical staff member perceptions regarding the patient safety culture in their organizations and any barriers they experience in preventing falls. Patients have the right to be free from harm when they are admitted to an IRF (Centers for Medicare & Medicaid Services, n.d.). It is crucial for healthcare organizations to take steps to eliminate preventable falls. By understanding the variations in safety culture perceptions and how this influences behaviors, healthcare leaders will then be able to design a patient safety program

targeted at reducing harm from falls. Previous studies have demonstrated the effectiveness of fall prevention protocols. However, adherence to the fall prevention protocol requires a culture of patient safety that facilitates consistent practice by the frontline staff.

Hospitals find improvement challenging to sustain, and they suffer "project fatigue" because so many problems need attention (Chassin & Loeb, 2013). Dr. Chassin, President and Chief Executive Officer of The Joint Commission encouraged hospital leaders to strive towards zero harm and to achieve consistent excellence throughout the organization by applying high-reliability science (Chassin, 2018). Patient safety culture is one of the critical areas that are crucial to high-reliability, and it is imperative for leaders to address and apply key tenets of high reliability organization to establish and continuously improve these components. A patient safety culture provides the context and environment that nurtures fall prevention programs and protocols.

The objective of this study is to examine the relationships between patient safety culture and processes of care, specifically, how patient safety culture influences the prevention of adverse events such as falls. The purpose of this inquiry is to explore how frontline staff perceives patient safety culture within their organization and whether it supports a safe and non-punitive environment for staff to learn from adverse events such as falls so that they can deploy strategies to mitigate risk and reduce patient falls.

Research Question and Specific Aims

This study will focus on one umbrella research question and specific aims which serve as the guide for interview questions.

Research Question: How does patient safety culture influence frontline staff's experience with patient fall in an inpatient rehabilitation hospital (IRF) setting?

Specific Aims:

1. To ascertain if patient safety culture influences adherence to fall prevention protocol.
2. To explore the special challenges faced by frontline staff in an IRF setting when taking care of high fall risk patients.
3. To identify the factors perceived by frontline staff that have impeded or continue to hamper their ability to prevent falls.
4. To explore the definition of patient safety culture through the lens of frontline staff.
5. To recognize the recommendations from frontline staff on how an organization can successfully integrate patient safety culture into their workplace.

Brief Description of Method and Analytical Approach

To fully understand this phenomenon, this research study used an interpretative phenomenological analysis (IPA) to discover the perceptions of a sample of IRF frontline staff in their efforts to reduce patient falls. This qualitative research intends to examine how the participants interpret their experiences with patient safety culture within their organizations and how patient safety culture influences their efforts in fall prevention.

This study was conducted at three IRF facilities using individual interviews to collect data. A qualitative, one-on-one interview methodology is ideal in obtaining detailed accounts from the participants without the influence of other members of the group under study. Each participant reflected on the questions posed and offered voluntary feedback. Although individual interviews can be compelling, there are also threats to validity that need to be addressed such as low level of trust, researcher bias, face-politeness needs, and deception (Powell-Cope et al., 2014). These threats can be minimized by utilizing an appreciative inquiry approach when interviewing the participants, and bracketing exercise before conducting interviews to reduce

personal biases towards the subject. The appreciative inquiry approach involves the art and practice of asking questions during interviews to evoke stories or perspectives from the interviewee that illuminate his or her strength (Cooperrider, Whitney, & Stavros, 2008). Safeguards were put in place to protect the rights of participants and maintain confidentiality. Their information were kept confidential by using pseudonyms (Creswell, 2014).

Data were coded and analyzed to examine patterns and themes. Through triangulation of data, multiple methods and sources of data collection were used such as interviews, observations and document analysis (Creswell, 2014). Utilizing suggested IPA analysis technique, coding was based on a heuristic framework (Smith, Flowers, & Larkin, 2009). The first step was to read and re-read the transcripts and make interpretative notes. Next, the researcher used the records to map inter-relationships, connections, and patterns. The set of emerging themes were then ordered chronologically to develop a chart or map of the participant's account of his or her experience. The researcher provided detailed results to the dissertation committee, and all phases of the study was subjected to scrutiny by committee members.

The findings was used to contribute towards research on prevention of adverse events through a shared understanding of organizational behavior and how patient safety culture could sustain improvement efforts. The results were interpreted in the AHRQ patient safety culture framework and the context of high reliability organizing to identify areas for improvement, which would aim to reduce preventable falls.

Chapter 2

Literature Review

Overview

A review of the literature spanning the period from January 2000 to July 2017 was undertaken to identify research associated with patient safety culture and fall prevention using the PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (http://prisma-statement.org/).

Selection of articles. The initial PubMed search on "patient falls" produced 20,915 citations and "patient safety" yielded 115,807 citations. By using the Boolean operators such as combining patient safety and falls, the search was narrowed down to 1,199 citations. Cumulative Index of Nursing and Allied Health Literature (CINAHL) has more relevant articles than other databases as they are specific for nursing and clinical research. When searching for "patient safety culture and falls" in CINAHL, there were only 132 articles. Virginia Commonwealth University (VCU) library also contains articles from Elton B. Stephens Co. (EBSCO) or Education Resource Information Center (ERIC). A general search in the VCU library using the search term "patient safety and falls" produced 118,536 citations from published articles, dissertations, and books. Google Scholar was occasionally used to search for any recent scholarly articles on these search topics. From the generated list of citations, the titles and abstracts were reviewed and then screened for potentially relevant studies before saving in Mendeley.com, citation software. Mendeley.com would periodically suggest relevant articles

based on the stored articles. Articles that were relevant were then included for full-text screening. Some articles were duplicates and removed from the list. A literature search for theories related to patient safety culture and psychological safety based on the author's names were reviewed in-depth. The researcher organized the relevant articles into three subfolders: factors affecting patient falls, intervention strategies to prevent falls, and organizational behavior transforming safety culture. Then, the researcher screened titles and abstracts to select the relevant articles associated with the research question.

Eligibility criteria and study selection. The literature search on this topic produced many articles, and selected articles include those in which the topics were relevant to this dissertation. There are many factors affecting patient falls and they can serve as both independent and dependent variables. The search was specific for scholarly literature about patient falls in hospitals, fall risk assessment tools, fall prevention interventions, staffing as it relates to patient falls, safety culture, safety behaviors, and compliance with safety protocols. The study designs consist of quantitative, qualitative, cross-sectional study, cohort study, mixed method, Delphi technique, and systematic reviews. In addition, the bibliography of articles related to inpatient rehab settings was further explored to look for commonly cited articles. Those articles were retrieved for full-text review.

Articles related to organizational behaviors and safety culture theories were also included for further review. These articles were usually from respected national journals such as Academy of Management Science, British Medical Journal, Journal of Management Studies, Health Care Management Review, and Journal of Nursing Management. The Agency for Healthcare Research and Quality (AHRQ) website was also searched for new releases on research articles pertinent to patient safety.

Exclusion criteria. Excluded studies consist of clinical studies on specific diagnosis, pharmaceutical studies, and irrelevant settings such as pediatric and mental health institutions. There were several studies from foreign countries in which the organizational structures and infrastructure are different from those in the United States, but they were analyzed carefully to determine if there was any close resemblance to the problems being studied. Excluded studies include those studies that were irrelevant to the United States. Articles on falls prevention in the community setting or outpatient setting were excluded because the preventive strategies were not applicable to an inpatient setting. Other excluded articles include those with descriptions of interventions with only descriptive and non-numerical assessment. The PRISMA flowchart in Figure 2 illustrates the literature search strategy.

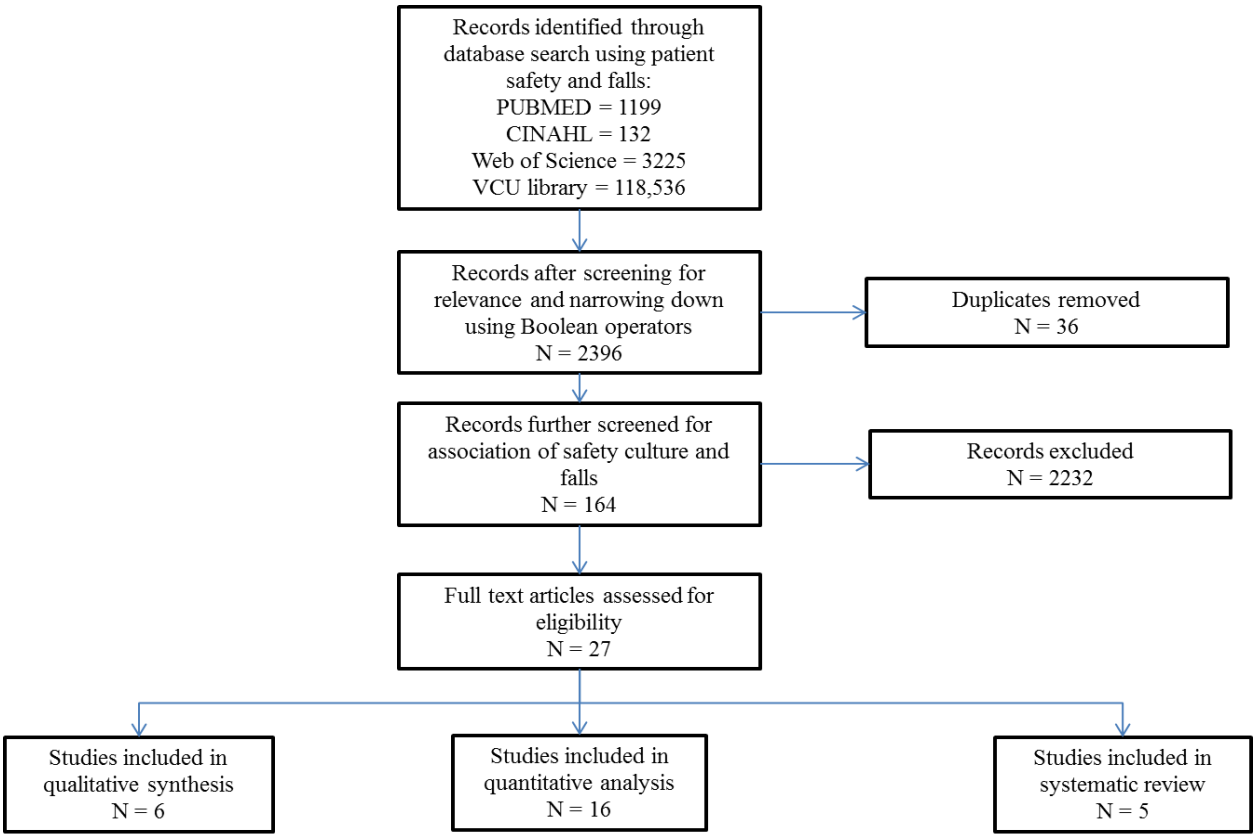

Figure 2. Flowchart of literature search strategy and manuscript selection

Reviewed Studies. The articles selected were reviewed for information on the aim of the study, study design, types of setting, intervention target and strategies, variables affecting compliance to care processes, human factors, organizational factors, results of the study, and limitations. Appendix A summarizes all the reviews.

Review Results

Falls and fall prevention. Effective October 1, 2008, the Centers for Medicare and Medicaid Services (CMS) launched the hospital-acquired condition (HAC) penalty program for acute care hospitals in which "Falls and trauma" were included in the 14 categories of HAC (www.cms.gov). CMS considers inpatient fall with a serious injury, a 'never event,' because such preventable adverse event should not occur while the patient is in the hospital. Even though the penalty program does not apply to IRF hospitals, CMS has started collecting data on percentages of patients experiencing one or more falls with a major injury at IRF effective October 1, 2016 (http://www.cms.gov/ Medicare/Quality-Initiatives-Patient-Assessment-Instruments/IRF-Quality-Reporting). The data on falls with major injuries were part of public reporting effective October 2018 under the Improving Medicare Post-Acute Care Transformation Act of 2014 (the IMPACT Act) (https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/IMPACT-Act-of-2014/IMPACT-Act-of-2014-Data-Standardization-and-Cross-Setting-Measures.html.)

There were a few studies on fall prevention and intervention strategies related to Inpatient Rehabilitation Facilities (IRF) setting. One study conducted in United Kingdom provided risk assessment and interventions similar to those used in acute care hospitals in United States but did not measure the effectiveness of those interventions (Ross, Egan, Zaman, Aziz, Dewald, and Muhammed, 2012). Another study aimed to identify best practices for fall prevention in the IRF

setting and found little evidence of success in single interventions, universal fall prevention strategies, and population-specific fall prevention strategies (Quigley, 2016).

The majority of fall prevention studies provided insights for clinicians and management leaders on effective and less effective strategies for reducing the risk of falls. For example, rounding on patients every hour or every two hours helps nurses keep patients safe by proactively meeting their needs (Hicks, 2015; Meade, Bursell, & Ketelsen, 2006). There was a small proportion of studies that evaluated the effectiveness of their approach, particularly the accuracy of risk assessment in ensuring the patients receive the right interventions (Ang, Mordiffi, & Wong, 2011). However, the result of the Ang, Mordiffi, and Wong (2011) study indicated that a universal approach to fall prevention was not effective and suggested an individualized approach such as having a dedicated "falls nurse" or increase in staffing. Most interventions were unique approaches combining different components and care processes such as hourly rounding, environmental checks, visual alerts, bed alarms, wheelchair alarms, bathroom assistance, and having patients wear non-skid socks or hip protectors (Neyens et al., 2011; Tzeng & Yin, 2015). These interventions are mostly geared towards patients who are at high risk for falls. The authors of several articles acknowledge in their limitations that further studies are needed to explore the factors causing non-compliance with fall prevention strategies.

Staff deviation from safety protocols. Fall prevention programs are typically complex with multiple components to consider, such as acuity, functional capacity and cognitive function of patients before applying intervention strategies.

Hempel et al. (2013) conducted a systematic literature review to compare the implementation of fall prevention strategies, the adherence, and effectiveness of fall prevention approaches and found that published articles do not have enough details regarding

implementation and adherence strategies. They compared four studies on how organizations monitor their adherence strategies and fidelity in fall prevention. The tools used by these studies included audit and feedback of adherence to care processes, using electronic health record to capture fall prevention interventions and monitoring, and sharing of falls data with team members to solicit input from frontline staff. The study found that no statistically significant intervention effect on fall rates. Hempel et al. (2013) discovered that the effectiveness of fall prevention strategies for preventing falls is only as good as their implementation and adherence strategies. As well, they found that adherence to safety protocols also depends on leadership involvement and cooperation from frontline staff (Hempel et al., 2013). There was sparse documentation on fall prevention implementation, and twenty-three (or 39%) of the studies in their systematic review did not report on adherence strategies to monitor whether the frontline staff completed implementing fall prevention processes.

Miake-Lye et al. (2013) reviewed 21 effectiveness studies on fall prevention and these studies hypothesized that the effectiveness of a fall prevention program is a result of effective implementation strategy by leaders, the chosen interventions, the type of monitoring strategies used to monitor adherence to care protocols, and the level of care provided to the patient. However, results show that there is no strong evidence about which of the chosen interventions is most important for success. These studies are focused on the clinical evidence-based element of fall prevention but not on the organizational behavioral aspect that defines the culture of an organization. Miake-Lye et al. (2013) identified seven themes from their systematic literature review that affect effective implementation: leadership support, engagement of frontline staff, multidisciplinary team approach, piloting intervention prior to deployment, using information

systems to collect and monitor data, changing attitude that falls is inevitable, and continuous education and training of staff on program adherence.

One cross-sectional study conducted in Australia measured compliance with the government's 6-PACK fall program which consists of a fall risk tool and individualized use of one or more of six interventions: "falls alert" sign, supervision of patients in the bathroom, ensuring personal properties within reach, toileting regimen, bed in low position, and use of bed or chair alarm (Barker et al., 2016). Barker et al. (2016) found that there was no difference in falls rate between units using 6-PACK program versus units with usual intervention. A follow-up study by Morello et al. (2017) on the 6-PACK program found that lack of compliance with protocol was one of the root causes of patient fall. The result of the study showed that the staff assessed fall risk on a majority of patients but only 63% implemented at least one of the 6-PACK interventions (Morello et al., 2017).

Several qualitative studies were conducted using semi-structured interviews and focus groups. The interviewees were staff members, patients, family members, and hospital management. Facilitators towards adherence to fall prevention protocol were hospital accreditation, a strong emphasis on patient safety, infrastructure, and dedicated champions. On the other hand, the barriers were heavy workloads, lack of time, lack of resources, and poor communication (Zecevic, Ho-ting, Ngo, Halligan, & Kothari, 2017).

A mixed-method study was conducted in an academic medical center in The Netherlands to explore factors affecting long-term adherence or non-adherence to hospital safety guidelines on fluid balance and body temperature (Knops et al., 2010). The researchers used focus groups to interview nurses on their perceptions of the barriers and facilitators of long-term adherence. Knops et al. (2010) found that nurses and doctors are more compliant with hospital guidelines if

they embrace the importance of patient safety for the patient. In their study, there was 100% compliance with fluid balance by the nurses because they embrace the safety aspect of following the guidelines plus it saves them time. However, there was only 50% compliance with the body temperature guidelines (BTG) when nurses and doctors did not find direct advantages in applying the guidelines. From their clinical experience, they believed the criteria set in the guidelines do not fit all patients' characteristics. Even though this study is not related to patient falls, it is relevant in measuring adherence to established guidelines or protocols.

Taken together, these studies suggest that staff lack of adherence to safety protocols can undermine even the most detailed, evidence-based fall prevention program. It is likely that patient safety culture influences staff adherence. The next set of literature review explores how patient safety culture affects how human variables and organizational behavior can affect the outcome of care, such as the prevention of patient falls.

Patient safety culture. According to Mardon, et al. (2010), different dimensions of patient safety culture in an organization such as leadership support, teamwork, fear of repercussions, organizational learning, communication openness, staffing, and event reporting may affect adverse events, and by extension, patient outcomes such as patient falls. This section discusses literature related to patient safety culture.

There were four studies to identify human factors that contributed to adverse events. Under-reporting of errors can be counter-productive towards quality improvement. There are various reasons for not reporting errors, and one of the obstacles is the fear of repercussions such as assigning blame, poor publicity, liability, and estrangement from peers (Castel, Ginsburg, Zaheer, & Tamim, 2015). Castel et al. (2015) observed variations in the degree of fear perceptions between nurses and physicians and suggested tailoring "speak up" improvement

strategies based on the need of the discipline. In another study done in five acute care hospitals in Singapore, the researchers sought to understand the perceived barriers to implementing fall prevention clinical practice guidelines and found that the barriers were lack of knowledge and motivation, lack of leadership support, and lack of access to equipment (Koh, Manias, Hutchinson, Donath, & Johnston, 2008). Roth, Brewer, and Weick (2016) used Delphi technique among an expert panel of nurses to determine the human factors affecting medical errors such as fatigue, heavy workload, critical thinking skills, impairment due to substance abuse, training, and lack of resources. Findings from their study indicate the need to focus on the nurse's biopsychosocial state such as fatigue, the environment of the unit such as the volume of patients, and tolerated risk due to questionable policy. The investigators also identified individual factors affecting nurses such as swamping and inattentional blindness. Swamping occurs when a nurse is overwhelmed by a situation and is unable to prioritize the tasks. When the nurse feels swamped, it can then lead to inattentional blindness which is a failure in recognizing something of primary importance in a situation because he or she is focusing on something else. One study surveyed rehabilitation patients instead of employees (Mihaljcic, Haines, Ponsford, & Stolwyk, 2017). This survey found that patients are more engaged and motivated in rehabilitation if there is more self-awareness of falls, and the investigators recommended teaching patients about falls risk.

A study conducted in a geriatric rehabilitation unit of an acute care hospital and a neurological unit of a rehabilitation hospital in Canada to assess the facilitators and barriers to implementation of Canada's Systemic Falls Investigative Method (SFIM) found that positive patient safety culture staff influences adherence to patient safety protocols (Zecevic et al., 2017). This study employed an explanatory mixed-methods study design by administering a Modified

Stanford Patient Safety Culture survey before implementing SFIM. The mixed-methods study started with conducting qualitative semi-structured interviews, followed by interviews with focus groups pre- and post-intervention. Results of their research showed that an overall poor safety culture at both hospitals hindered the implementation of patient safety protocols. Facilitators of SFIM were good infrastructure and dedicated champions, strong emphasis by leaders on patient safety, and the desire to meet hospital accreditation standards. Barriers to successful implementation of SFIM included heavy workloads, lack of time, lack of resources, and poor communication.

Three cross-sectional studies explored the perception of safety climate among frontline staff, nurses, and doctors. One study conducted on two hospitals with acute and subacute units in Australia examined the perception of safety climate among frontline staff and their attitude towards fall prevention and identified teamwork as an essential factor for fall prevention (Black, Brauer, Bell, Economidis, & Haines, 2011). Bonner, Castle, Men, and Handler (2009) conducted a cross-sectional study using the AHRQ patient safety culture survey with certified nursing assistants (CNA) in skilled nursing facilities and found that higher patient safety culture scores correlate with lower adverse events such as patient falls rate, pressure ulcer rate, and daily restraint use. Another cross-sectional study using AHRQ patient safety culture survey done in Chinese inpatient hospitals and emergency departments concluded that organizational learning correlated with the lower occurrence of pressure ulcer rates and patient complaints, but not with patient falls (Wang et al., 2014).

Summary – Integration of Fall Prevention with Patient Safety Culture.

Staff perception of the values and norms of an organization shapes its members' behavior, but there is limited research linking safety culture to effectiveness in prevention of falls

(Mardon et al., 2010). Black et al. (2011) surveyed frontline hospital staff in two Australian hospitals on their perception of safety climate and attitude towards fall prevention. While most of their findings correlated positively with safety climate, the staff was reluctant to report their errors as well as those made by their peers (Black et al., 2011). The overall percentage of unfavorable responses towards fall prevention was 15%. Dimensions of patient safety culture that did not rate favorably were 'provisions of care' (unfavorable response at 42.1%), and 'unit recognition and support for safety efforts' (unfavorable response at 26.9%). This study provides an important insight into frontline staff's perception of the problematic areas in safety climate and requires further research to improve the problematic dimensions of patient safety culture towards fall prevention.

Wang et al. (2014) conducted a cross-sectional study in China using the AHRQ survey to examine the relationship between patient safety culture and frequencies of the adverse events report. In their research, the investigators confirmed their hypothesis that improvement in patient safety culture score correlates with a decrease in the occurrence of adverse events. They find that there is a significant correlation between the lower occurrence of an adverse event with positive mean scores on "organizational learning" and "frequency of event reporting'' (Wang et al., 2014).

Four systematic reviews were analyzed to determine if there is research evidence on barriers and facilitators that influence adherence to fall prevention programs and interventions. Mardon et al. (2010) found a correlation in patient safety culture scores and adverse events. Hospitals with more positive patient safety cultures scores have fewer adverse events. In contrast, another systematic review found that the small number of adverse events was inadequate to detect a significant correlation between safety culture and nurse-sensitive

outcomes (Dicuccio, 2015). These two studies explored the relationship between patient safety culture and multiple adverse events but not precisely to understand the facilitators and barriers to implement prevention strategies. Ohde et al. (2012), found that increased rate of staff compliance in implementing an intervention plan correlates with a decrease in rates of patient falls. Although robust interventions are necessary for fall prevention, a "culture of compliance" plays a critical role in improving quality (Ohde et al., 2012). A systematic review of randomized controlled trials done in long-term care to assess fall incidents among elderly residents suggested that the effectiveness of fall preventive interventions is dependent on successful implementation processes (Neyens et al., 2011). Although these studies indicate that there is a relationship between patient safety culture and preventable patient falls, there is still a gap in the literature regarding barriers and facilitators of fall prevention that may be related to patient safety culture. This study aims to fill that gap.

Conceptual Framework

How safety culture affects adherence to safety protocol in an IRF setting requires further exploration. Quantitative study alone does not provide a full explanation on the lack of adherence to fall prevention protocols. Qualitative research to explore the themes drawn from the quantitative literature will provide a more comprehensive understanding of organizational factors that influence healthcare workers in complying with evidence-based best practices.

Given the increase in the aging population in the United States, more elderly patients are entering IRF for intensive therapy. It is crucial that healthcare workers adhere closely to fall prevention interventions and prevent fall-related injuries. Complications as a result of falls can result in increased length of stay and increased socio-economic burden to the society. Ultimately,

the development of effective intervention strategies aimed at reducing falls risk in an IRF population needs to take into consideration the human variables that drive compliance.

This systematic literature review identified gaps in the literature on how patient safety culture affects outcomes of care such as fall prevention. Also, most studies linking patient safety culture to adverse events are related to the acute care setting or long-term care setting, but there are limited studies done in an IRF setting. A literature map to illustrate how this study will contribute to the larger body of research as shown below in Figure 3 (Creswell, 2014). This literature can be underpinned by a high reliability framework (Weick & Sutcliffe, 2001) discussed in Chapter 3.

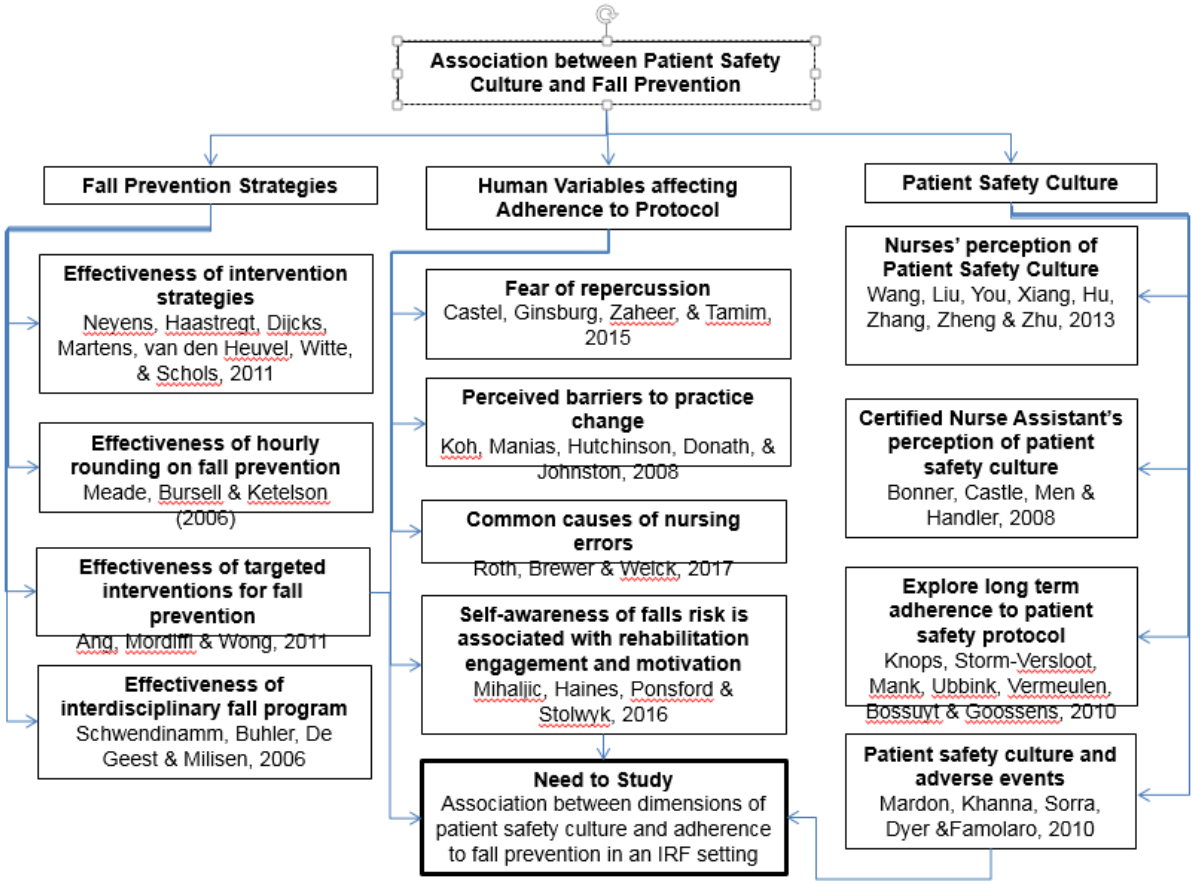

Figure 3. Literature map to identify the gap and the need to study

Chapter 3

Theoretical Framework or Premises of Study

Explanation of the theories on Human Error and High Reliability Organization

The success of a healthcare organization is dependent on the work of highly skilled professionals such as nurses, doctors, and allied health clinicians. Operational failures may occur during the patient care delivery process due to human errors. Frontline staff is more apt in finding the underlying causes of errors and suggests changes in activities and processes based on their experience (Tucker & Edmondson, 2003). Leaders, on the other hand, have a primary function to influence their employees by creating an environment that cultivates learning, empowers employees to voice concerns, and aligns organizational values with every decision made (Frankel, Haraden, Federico, & Lenoci-Edwards, 2017). This section will first discuss the history of the study of human error in industries, such as healthcare, where error can have devastating consequences. It will then present the High Reliability Organizing (HRO) framework and how it relates to error reduction. HRO strives for the highest level of reliability for each process to ensure the desired outcomes are congruent with goals. This framework can be applied to fall prevention in an inpatient rehabilitation facility (IRF) setting. If the frontline staff finds that the process of applying fall prevention strategies is not generating the desired outcomes, then the team will revisit the process and identify and address any root causes that could have prevented a fall. Leaders play a role in ensuring safe and reliable care by being supportive of the

staff and allowing them the autonomy to make decisions in process improvement (Frankel et al., 2017).

Human Error

Since the 1990s, there have been extensive studies done regarding human errors. Huge disasters such as the Tenerife runway collision in 1977, Three Mile Island nuclear accident in 1978, and the Challenger and Chernobyl disasters of 1986, had sparked growing public concerns over the high cost of human errors (Reason, 1990). The Tenerife runway collision involved two Boeing 747 jets, KLM and Pan Am, which collided on the runway killing 583 people (Weick, 2004). The primary cause of the collision was due to the misunderstanding of radio communications between the KLM flight captain and the air traffic controller (Weick, 2004). Perrow (1984) described the nuclear accident at Three Mile Island as failures caused by human factors such as the plant operators not recognizing mechanical failures due to inadequate training. A minor malfunction in the secondary cooling circuit triggered the temperature to rise in the primary coolant, but the operators were unable to diagnose or respond appropriately to the unplanned automatic shutdown of the reactor (Perrow, 2011). Eight years later, a major disaster happened when the space shuttle Challenger broke apart seconds after it launched because the O-ring seal system used in the joint was not designed to handle unusually cold conditions that existed at the launch of the rocket (Reason, 1990). In the same year, 1986, another catastrophic nuclear accident happened at Chernobyl, Russia, which was caused by human errors, and violations of safety procedures (Reason, 1990).

The healthcare industry is a high-risk environment, much like those described above. High-risk industries, such as the nuclear energy industry, have learned from past mistakes and strived for zero harm. However, the concept of zero harm remains difficult to achieve in the

healthcare arena (Vogus, Sutcliffe, & Weick, 2010). Preventable medical errors continue to persist in organizations despite efforts by healthcare administrators and regulatory agencies in making workplace safety the highest priority (Padgett, Gossett, Mayer, Chien, & Turner, 2017). When an error occurs, leaders tend to assign blame to individuals, which is a misguided way of thinking about failure (Edmondson, 2011). Most errors are not caused by individuals, but rather by groups of healthcare providers, and they are collectively accountable within the framework and systems of delivery of care (Bell, Delbanco, Anderson-Shaw, McDonald, & Gallagher, 2011). It is important to understand the root causes of errors before assigning culpability.

Researchers, psychologists, and organizational theorists have investigated the causes of human errors and the efficacy of preventive strategies and came up with three levels of analysis for considering errors: individual, system-level, and group-level (Edmondson, 2004). When analyzing adverse events at an individual level, the focus is on human errors such as physiological and educational deficits (Edmondson, 2004). Instead of focusing on individuals, Perrow (1984), the Institute of Medicine (Kohn, Corrigan, & Donaldson, 2000), and Reason (1990) all proposed using a system-level approach to investigate the underlying causes of human errors and determine if the system design contributes towards the adverse event. Individual and system failures are inevitable, but when people work as a team, there is a different level of performance due to the unconscious influence of team members. Thus, Edmondson (2014) suggested analyzing human errors from a group-level perspective.

The high reliability organizing theoretical framework was developed to avoid catastrophes in an environment in which normal accidents can be expected due to risk factors and complexity (Perrow, 1984). Perrow (1984) hypothesized that regardless of the effectiveness of management and operations, accidents are normal and inevitable in systems that are tightly

coupled and have high interactive complexity because they cannot be foreseen or prevented. He developed a framework for analyzing failures within and between systems. Instead of blaming human errors, Perrow (1984) asserted that errors often happen as part of normal operations and categorized systems based on how the errors interact within the larger system. If failures propagate and interact predictably, the system is considered to be having linear interactions. On the other hand, if the failures are unpredictable or not immediately comprehensible, they are deemed to be complex interactions (Perrow, 1984).

In Perrow's normal accident theory, he further categorized systems by their ability to detect and respond to failures. Tightly coupled systems have no slack or buffer between two parts and what happens to one component will directly affect the other. Loosely coupled system tend to be independent allowing each component to perform on its own (Perrow, 1984). When failures happen in a tightly coupled system, it takes longer to detect and respond, but in a loosely coupled system, there are buffers built in to incorporate shocks and failures without destabilizing the whole system making it relatively easier to detect and respond to failures. Perrow (1984) stated that each system has its virtue and vice, and one is not necessarily better than the other. Organizations can be categorized based on the two dimensions: interaction and coupling. Nuclear organizations have complex interactions, and tight coupling whereas the United States Postal Service is linear with loose coupling. The two dimensions of organizations – complex versus linear interactions, tight versus loose coupling – provide a robust framework for analyzing risks in an organization (Chera et al., 2015).

In healthcare organizations, some interactions are complex, and some have either tight coupling or loose coupling depending on the specific process and its flow. Most patients obtain care through a diverse group of providers (e.g., physicians, nurses, therapists, social workers, and

dietitians) and often through multiple care transitions such as from a physician office to an emergency department to an inpatient setting. Caring for one patient involves numerous handoffs, and interactions among disciplines, which present opportunities for errors (Chera et al., 2015). Although there is some variation, healthcare organizations are often tightly coupled with the various disciplines and work processes that are interconnected. When an individual error happens, it inadvertently affects other processes, which if not intercepted, may ultimately affect the patient (Weick, 2004). An example of how an individual error can occur in fall prevention is when a nursing technician forgets to place the call bell within the patient's reach. Another example is when a physical therapist provides aggressive physical therapy before a patient's balance has been established (Currie, 2008). When all of these parts work in silos, it is frequently difficult to detect how errors will propagate through the system (Reason, 1990).

Distinguishing between error and failure is essential. This study will focus on failure that is due to an error. Failure is a result of a combination of errors that may occur when there are violations of policies, risk-taking, and chance factors (Frese & Keith, 2015). Not all errors lead to failure if they can be detected and corrected immediately. An example in healthcare is in fall prevention when a nursing technician assists a confused patient to the bathroom but leaves the patient unattended in the bathroom. The patient then gets up from the commode, feels dizzy, and collapses on the floor. The act of leaving the patient unattended in the bathroom is a result of deviance in following protocol. However, it is unknown whether the failure is due to other underlying reasons such as distraction, staffing shortage, or normalized deviance from the protocol.

Thus, the Institute of Medicine recommends designing safe systems by understanding the causes of errors using an error taxonomy as proposed by Denmark human factors expert, Jens

Rasmussen (Rasmussen, Duncan, & Leplat, 1987) and elaborated by British psychologist, James Reason (Reason, 1990) to minimize errors and allow early detection before the error happens (Kohn, Corrigan, & Donaldson, 2000). Reason (1990) developed a working framework for human errors called generic error-modeling system (GEMS) based on Rasmussen's classification of human performance. The three types of errors are 1) skill-based, 2) rule-based; and 3) knowledge-based. Skill-based errors are slips and lapses caused by routine actions in a familiar environment, rule-based errors are due to wrong application of the rule, and knowledge-based errors are failures caused by "bounded-rationality" in which the problem is addressed using inadequate knowledge (Reason, 1990). An example of a skill-based error that frequently occurs in fall prevention is forgetting to check if the patient's bed alarm is turned on after transferring a high fall risk patient to his or her bed, which can then lead to a fall if the patient attempts to get out of bed without assistance. A rule-based error happens when a nurse does not correctly assess the patient's risk factors and thus assigns the wrong fall risk level which then leads to incomplete precautionary applications to prevent falls. Knowledge-based errors often occur due to a lack of critical thinking skills or lack of experience. For example, a new nurse may lack the knowledge that certain medications have sedative effects on the patient and fail to apply extra precautions to prevent falls.

The healthcare industry has traditionally attributed human errors to the failings of individual providers, such as low skill or knowledge (AHRQ, 2017). There is limited focus on systems errors as a result of poorly designed systems. By viewing errors using the systems approach, Reason (1990) asserted that most accidents result from multiple, smaller errors in environments with serious underlying system flaws. Reason (1990) introduced the Swiss Cheese Model of Error to illustrate how accidents happen as shown in Figure 4.

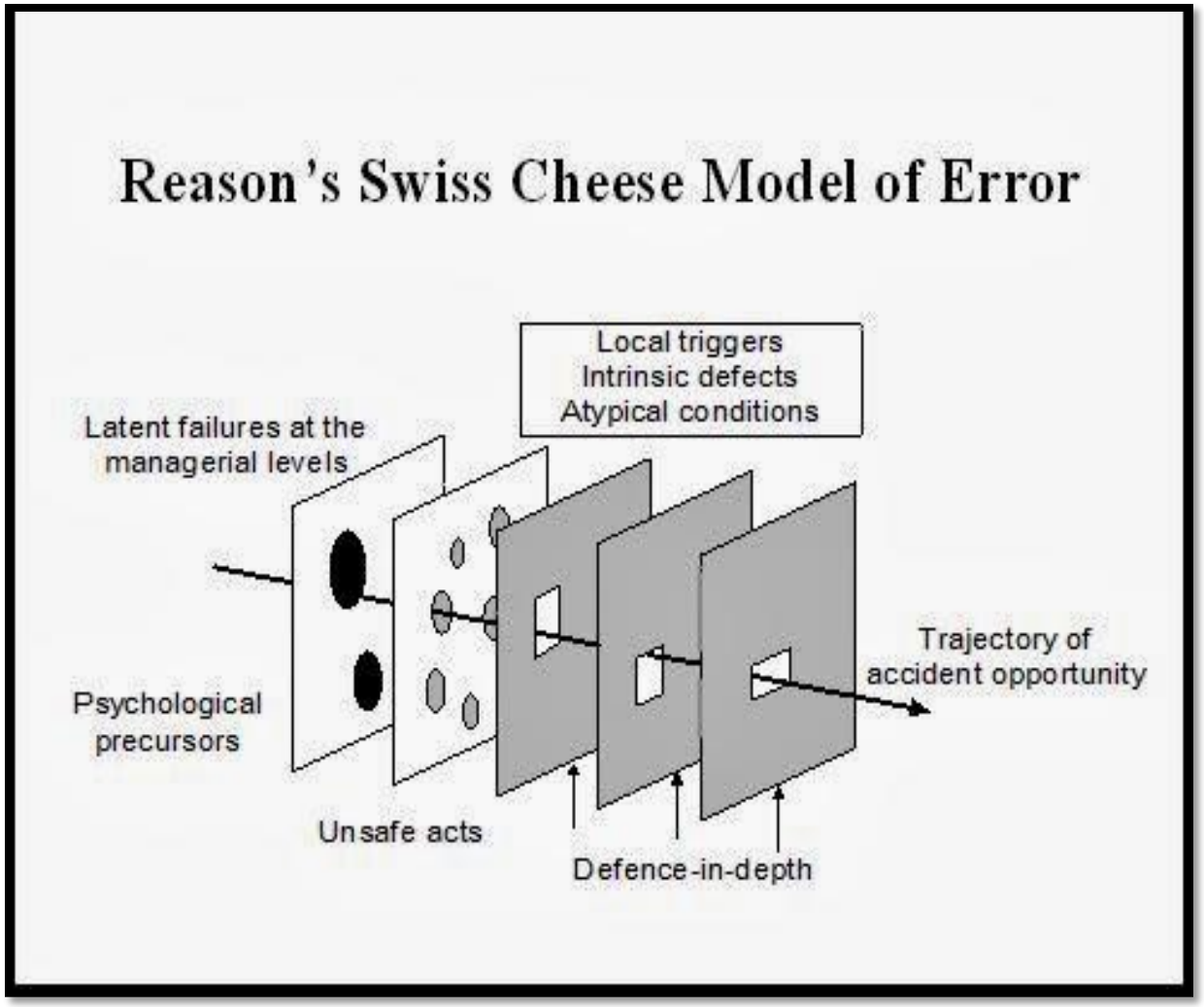

Figure 4. Adapted from Human Error (Reason, 1990), Figure 7.8, pg. 208. Reproduced with permission from Cambridge University Press on June 18, 2018. The dynamics of accident causation. The diagram shows a trajectory of accident opportunity penetrating several defensive systems. This results from a complex interaction between latent failures and a variety of local triggering events.

In this model, the holes in the Swiss cheese represent flaws in the systems which allow errors made by individuals to pass through and thus result in disastrous consequences. This model assumes that the primary systemic origins of latent failures are the "fallible decisions at the managerial levels" (Reason, 1990, p. 203). The term "fallible decisions at managerial levels" is not meant to assign blame, but rather, to acknowledge that there is no perfect process design. Psychological precursors of unsafe acts refer to human conditions caused by the environment

such as undue time pressure, high workload, and inappropriate perception of hazards. When the line management deficiencies interact with psychological precursors of unsafe acts, it can lead to active failure called unsafe acts. Frequently in the design of a process, management and process engineers put in place automatic safety devices or redundant steps to act as defenses against errors. Reason (1990) termed these as "defence-in-depth" (p. 179). If those unsafe acts manage to pass through "defence-in-depth," it will result in an accident. When patient falls happen, managers use this Swiss Cheese Model of Accident Causation to understand and explain how errors happen (Watson, Salmoni, & Zecevic, 2018). Not only is this model a powerful tool to explain the process but also it assists in pointing the way to a solution. It encourages management and personnel to identify the gaps in practice so that they can work on shrinking the size of the gap and create more "defence-in-depth" so that the holes do not line up in the future. Rather than assigning blames on individuals and focusing on corrective actions, managers can use this systems approach to identify factors or situations that lead to human error, and modify the process or procedure for future reduction of similar occurrence of errors. Such a concept could lie in the context of a patient safety culture and could set an organization on the path toward HRO processes.

Human error is inevitable due to the limits of human information processing, primarily when working in a complex system such as healthcare (Rasmussen, 1997). This fundamental insight remains underemphasized as healthcare organizations strive for perfect safety and expect flawless performance (AHRQ, 2017). We are quick to punish or blame failures on those individuals who make the mistakes at the "sharp end", which is not valid given the complex and high-stress environment in healthcare. Reason's model of "defence-in-depth" serves to catch unsafe acts before they occur or block them from causing harm.

In the Swiss Cheese Model, Reason (1990) used the terms "active" and "latent" failures to distinguish between individual versus system errors (p. 173). Active failures occur at the point of contact and are unsafe acts committed in the presence of a potential hazard such as a physical therapist not using a gait belt to hold onto a patient while ambulating which may then lead to a fall when the patient has an unsteady gait (Reason, 1990). These types of errors usually occur at the "sharp end" (Reason, 1990) where the clinicians are involved in the most difficult or dangerous aspects of the process. By contrast, latent failures are preconditions or psychological precursors that are due to line management deficiencies such as inadequate procedures or deficiencies in skills that allow the inevitable active errors to cause harm (Reason, 1990). In healthcare, the "blunt end" (Reason, 1990) refers to management staff who are not in direct contact with patients. Examples of latent errors as a result of inadequate process designs by line managers include failed communication, ineffective handoffs, poor supervision, high workload, and insufficient training (Lawton, Carruthers, Gardner, Wright, & McEachan, 2012). Regarding fall and injury prevention, latent errors can happen if management does not apply appropriate standards, training, or support for the frontline staff in their practice of fall assessment and fall prevention (Currie, 2008). Latent errors are indicators of varying degrees of patient safety culture.

High Reliability Organizations (HRO)

Organizations that embrace high reliability science have been successful in reducing errors (Chassin & Loeb, 2013). High reliability organizations (HRO) are organizations that follow five principles of behavior that account for their ability to prevent and contain unexpected catastrophic events (Sutcliffe, 2011). The five behaviors are preoccupation with failure, reluctance to simplify interpretations, sensitivity to operations, commitment to resilience, and

deference to expertise (Sutcliffe, 2011). Healthcare organizations can adapt and apply high reliability science to reach high levels of quality and safety.

Through a good understanding of how accidents happen and how errors occur, HROs use mindful organizing to guide their efforts in reducing errors and set expectations for their employees to manage the unexpected outcomes (Weick & Sutcliffe, 2001). Despite operating in high-risk settings with complex operations, HROs believe error-free performance can be achieved through top leadership commitment to zero harm and a culture of collective mindfulness within the organization in which all employees are not afraid to speak up for safety (Chassin, 2018). Weick and Sutcliffe (2001) described mindful organizing as a practice by the frontline workers, who always look out for, and report, small problems or unsafe conditions before they pose a substantial risk to the organization. Classic examples of HROs include nuclear power industry, aviation industry, and emergency medical treatment departments, in which errors can have severe implications for public safety (Su, 2017).

Organizations that are obsessed with safety are constantly searching for new ways to reduce errors. As shown in Table 1, such organizations apply the five principles of high reliability science to look for potential problems, to examine the gaps in their current processes, and to mitigate any risks that may result in failures (Sutcliffe, 2011).

Table 1

High Reliability Organization Principles adapted from Sutcliffe (2011)

Principle	Definition
Preoccupation with failure	HRO preemptively looks out for a potential problem and early signs of failure or mistakes even though an adverse event has not occurred yet. Near misses and close calls are treated as indicators of potentially larger problems.
Reluctance to simplify	HROs deliberately look for complexity in the situation and question the assumptions that may interfere with a deeper analysis of the situation.
Sensitivity to operations	HROs are realistic and understand that actual operations may not be done as prescribed. They do not place blame but acknowledge that errors happen and they can be either systematic or individual error. Ongoing attention to latent failures allows the organizations opportunities to make adjustments to stop the small mistakes before they line up to a larger catastrophe.
Commitment to resilience	HROs develop capabilities to cope with adverse events by creating contingency plans and practice worst-case scenarios to enable smooth operation of other processes while fixing the problem at hand.
Deference to expertise	Expertise does not always follow the chain of command. During a crisis, decision-making migrates to the person with the most knowledge without regard to rank and file. HRO leaders welcome input from and encourage communication between all levels of the organization.

***Preoccupation with failure*.** Small inattention to details and misperception by trying to normalize an unexpected event can cause serious adverse events (Weick, 2004). Weick and Sutcliffe (2001) described mindfulness as a relentless attempt to reexamine prior knowledge gained through failures, monitor how current operations are affecting outcomes, and, remove or minimize blind spots. HROs use mindful organizing to scrutinize existing operations, evaluate best practices, and continuously improve after finding mistakes. HROs do not take adverse events for granted and analyze every near miss to gain an understanding of what causes the failures. They expect failures and constructively look for them. If the organization finds gaps in the Swiss Cheese Model, it will come up with solutions to close the gaps before an active failure passes through the trajectory of accident opportunity. Unlike most organizations, HROs view lapse as a sign of weakness in other portions of their system and they train their staff to analyze the effects of their errors on upstream and downstream workflows (Weick & Sutcliffe, 2001).

Incident reporting is a necessary component for the success of incident reviews. Employees need to feel safe to report incidents and speak up when something is wrong (Edmondson, 2003). Leaders play a role in psychological safety which is a crucial antecedent to encouraging employees to question current practices and to reward people who report errors or mistakes (Nembhard & Edmondson, 2006). HRO leaders take the initiative to conduct daily incident reviews and take swift actions to correct the problems even if it is only a close call. They encourage and reward incident reporting so that the employees can be candid about what happened and participate in process improvement (Edmondson & Nembhard, 2009).

***Reluctance to simplify interpretations*.** HROs resist simplification but instead require an interdisciplinary team to work together to walk through every step of the process. Weick and Sutcliffe (2001) stated that "simple expectations produce simple sensing" (Weick & Sutcliffe,

2001, pg 62) because simplification can produce blind spots. A diverse group of team members with different functional backgrounds are better able to sense mistakes in a complex and varied environment because of diverse viewpoints.

***Sensitivity to operations*.** Unlike an incident command system in which there are three levels of commands based on a hierarchical approach, HROs work to reduce differences among the hierarchies by maintaining situational awareness, and keeping an overall picture of the operations (Weick & Sutcliffe, 2001). Information about operations is integrated with the system's performance so that everyone is aware of what is going on with other departments. When faced with an unexpected breakdown in one department, all levels of the organization are adaptive and interact with one another to solve the problem (Rasmussen, 1997). Frequent meetings and daily huddles to keep one another informed are essential to keep each other abreast of current developments. The whole team can identify problems early so that actions can be taken before a problem or failure becomes a disaster.

***Commitment to resilience*.** HROs do not expect zero error and perfect performance, instead, they foresee hazards due to human fallibility and believe that error is omnipresent (Weick & Sutcliffe, 2001). Managers ought to be cognizant of errors and be resilient in making corrections to processes before they cause further harm. They are flexible and use a different mindset to cope with the unexpected and can make sense of an emerging pattern. To be resilient, managers ought to keep the errors small, continue to improvise workarounds that keep system functioning, and at the same time absorb changes that may occur while persisting.

Resilient managers mitigate risks rather than anticipate them (Weick, Sutcliffe, & Obstfeld, 1999). When an error happens, a resilient organization is quick to absorb the strain from the event and still work to preserve function so that the organization can return to regular

service. HROs seek to learn from past mistakes and continuously improve and bounce back from difficulties (Weick & Sutcliffe, 2001). A commitment to resilience is necessary for a highly complex, and tightly coupled organization and the employees must be trained to have a mindset that there is no perfect process and be continually wary that things can fail. HROs encourage employees to question what is happening rather than pretend they understand, and to speak up regardless of rank and file in the face of uncertainty (Edmondson, 2011).

Deference to expertise. During routine operation, HROs operate under a hierarchical pattern of authority. However, when conditions are at high risk and circumstances are changing rapidly, subject matter experts will assume the role of the leader and respond to the urgent situation. In an HRO, decision making is not based on rank but instead based on expertise and whoever is knowledgeable in solving the problem. The leadership role can change in response to different circumstances (Weick & Sutcliffe, 2001). Employees are taught to recognize their limits of knowledge and have the strength and confidence to seek help from other experts.

Conceptual Model

Healthcare organizations want a structure to support safety processes and make safety a priority. First, healthcare leaders seek to recognize the distinction between the three levels of errors: individual, group, and system (Edmondson, 2004). Human error is a construct that has multi-level antecedents, mediating processes, and outcomes (Goodman et al., 2011). Figure 5 below summarizes this conceptual model.

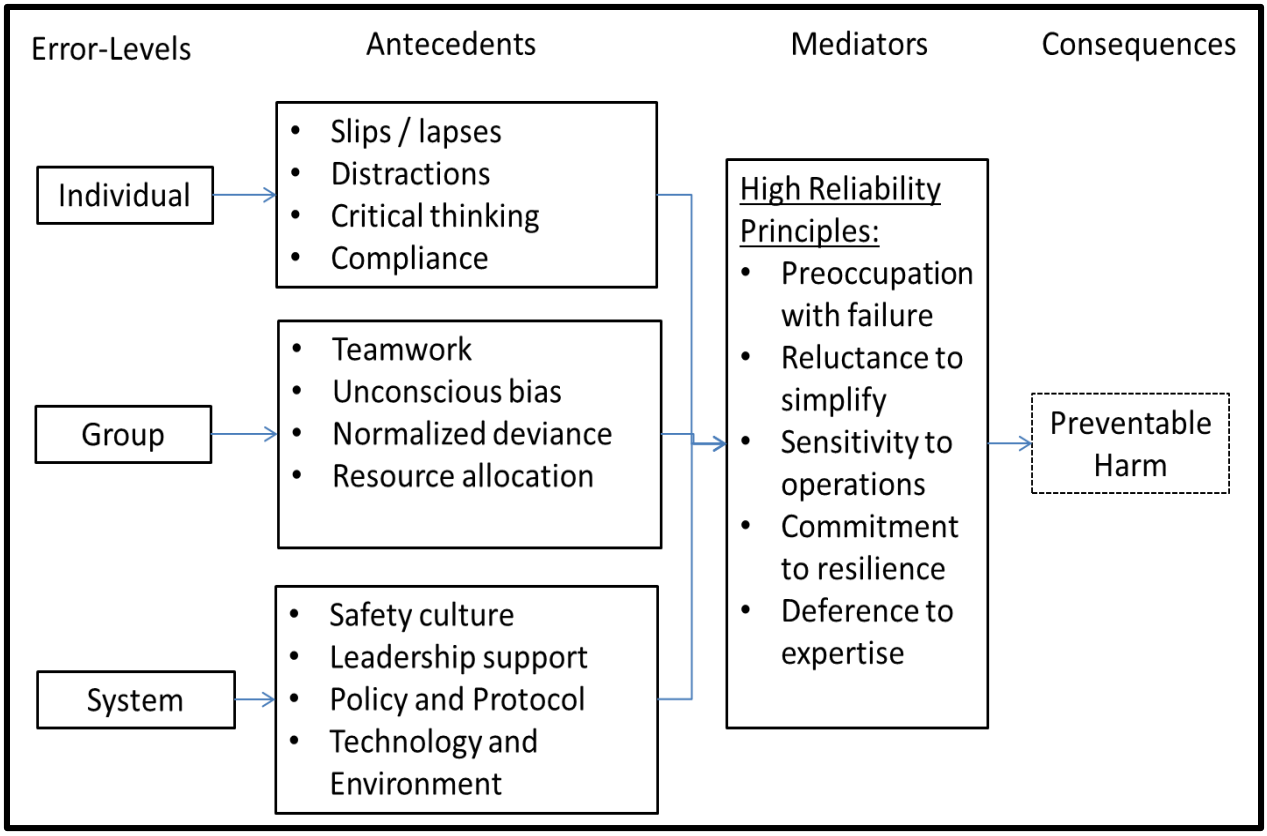

Figure 5. Conceptual Model for Error Prevention. The antecedents of error prevention are dimensions of safety culture such as teamwork, resource allocation, leadership support, and organizational learning. Organizations then use High Reliability Principles as mediators to mitigate errors caused by individual, group, and system levels.

At the individual-level, skill-based and rule-based errors as described by Reason (1990) are common. When operating at a group-level, team dynamics can influence the performance of the team which can then lead to errors. At the system-level, the design of the organization based on loose-tight coupling and interactive complexity can be antecedents to failures if they are not designed to support the structure of the organization (Cannon & Edmondson, 2005). Organizations can strive for an accident-free system by applying the principles of HRO which can serve as mediators to prevent active and latent errors. The mediators are "defence-in-depth" as described by Reason (1990) to catch errors or act as stop gaps to prevent errors. The basic principles of HRO center on error-avoiding, and when applied by organizations, it can promote a

culture of safety (Goodman et al., 2011). In healthcare organizations, a strong safety culture will enable healthcare personnel to focus their attention on adhering safe practices (Vogus & Singer, 2016). This conceptual framework applies to this study on fall prevention. By recognizing the types of errors that a frontline staff may commit at the "sharp end", and management staff may commit at the "blunt end", healthcare organizations can use systems thinking to evaluate and design fall prevention protocols. Caring for high fall risk patients is complex due to the patient's physiological state and variation in the care setting such as in a patient room versus in a gymnasium. There are always new threats to safety, endemic uncertainty, and no two patients are exactly alike. Thus, by applying the concept of HRO, an organization can create an environment in which potential problems that can cause a patient to fall is anticipated, staff can detect patient movement early, and respond early enough to prevent a patient fall.

Chapter 4

Method

Introduction and Overview

The purpose of this research was to explore with a sample of Inpatient Rehabilitation Facilities (IRF) frontline staff their perceptions and experiences with fall prevention protocol and patient safety culture. A better understanding of the phenomena will allow hospital leaders to design a more effective fall prevention program that will aim to lead to zero preventable falls. This qualitative study employed the interpretative phenomenological analysis (IPA) method to examine patient safety culture as it relates to fall prevention with employees at three IRF hospitals; two from a standalone IRF organization and one from an inpatient rehabilitation unit within an academic medical center. In order to uncover the thoughts of the employees and to study their perspective, the researcher chose to use the phenomenology approach to gain a richer understanding of employee experiences (Smith et al., 2009). The IPA methodology was suitable for this research because it was a design of inquiry in which the researcher interviewed a group of participants who were experiencing the phenomenon (Creswell, 2014). Frontline employees within these facilities were interviewed on their experiences with fall prevention, how they chose to use fall prevention strategies, and how they perceived the culture of safety in relation to fall prevention. For this research, the term "frontline employees" refer to the direct patient care providers such as nurses, physical therapists, occupational therapists, and technicians. This method was used to find out what people think about teamwork, leadership, communication, and the role they play to decrease harm and improve patient safety.

In seeking to understand the effect of patient safety culture on patient falls, the researcher explored the research question and used the specific aims to guide the interviews and gathered the information needed to answer the research question:

Research Question:

How does patient safety culture influence frontline staff's experience with patient fall in an inpatient rehabilitation hospital (IRF) setting?

Specific Aims:

1. This research seeks to ascertain if patient safety culture influences adherence to fall prevention protocols.
2. To explore the special challenges faced by frontline staff in an IRF setting when taking care of high fall risk patients.
3. To identify the factors perceived by frontline staff that have impeded or continue to hamper their ability to prevent falls.
4. To explore the definition of patient safety culture through the lens of frontline staff.
5. To recognize the recommendations from frontline staff on how an organization can successfully integrate patient safety culture into their workplace.

Study Design

Preliminary data on patient falls obtained from the standalone IRF organization for the period of 2012 to 2017 showed that substantial numbers of falls were preventable. There was no similar data available from the rehab unit of the academic medical center because the methodology of data collection did not include preventability of falls. Typically, data on causes of falls are not readily available because they are considered “patient safety work product” under The Patient Safety and Quality Improvement Act of 2005 (PSQIA) (Gliklich, Dreyer, & Leavy,

2014). However, research has shown that close to one-third of patient falls are preventable (Agency for Healthcare Research and Quality, 2013; Campbell, 2016). There is also no direct measure of "culture of compliance" as described by Ohde, et al. (2012) to correlate with the patient falls data. Even though the Agency for Healthcare Research and Quality (AHRQ) safety culture survey had been conducted for both organizations, there was no way to link the findings to root causes of patient falls directly. The researcher therefore proposed using a qualitative phenomenological study design to explore the phenomena associated with patient safety culture and how it affected compliance with fall prevention protocol. Through qualitative interviews, the researcher would like to further identify non-quantifiable variables by listening to the experiences and perspectives of the frontline staff who respond to fall events (Creswell & Poth, 2018). This study is designed to find out the perceptions of fall prevention by frontline staff as well as to identify the gaps in adherence behavior through the themes expressed by this representative group of employees.

Setting

The sites of the study consisted of three acute rehab hospitals with two stand-alone rehab hospitals and a rehab unit within an academic medical center in the Mid-Atlantic east coast region of the United States. The senior executives and department leaders at both organizations gave permission to conduct the studies at their respective sites. Approval from Virginia Commonwealth University Institutional Review Board (VCU IRB) met the formal approval from both organizations. VCU IRB approved this study number HM20014543 on December 13, 2018.

It is important to note that an IRF can be a stand-alone rehabilitation hospital or it can be in a separate wing of a hospital such as a rehabilitation unit at an acute care hospital. The participating facilities were located within a 20 miles radius of each other. One organization has

two IRF hospitals with 40 and 28 beds, which will be referred to as Hospital A and Hospital B, respectively. The 40-bed hospital is located in the northeast corridor of a greater metropolitan area whereas the 28-bed hospital is located in the southwest part of the area. The other organization is an academic medical center located in the downtown area with one rehabilitation unit consisting of 44 beds which will be referred to as Hospital C. Each hospital has its management team and employees, but they use similar fall prevention protocols established by each organization. The researcher recruited participants from all three hospitals.

Researcher in the Context

The researcher is an employee of Hospital A and Hospital B and had to be mindful of the risk of potential biases in the role of a researcher. She is well-known to the management team and frontline staff. Before initiating the research, the researcher had gone through a bracketing interview to identify and bring awareness of her potential bias on patient safety culture and fall prevention so that she could go into the field with minimal preconceived attitudes, beliefs, or opinions about the subject. Bracketing refers to a researcher's personal experience with the study phenomena, vested interests in the subject, assumptions, and hunches that can influence the study data. A bracketing interview serves to place these involvements in "brackets" so that they are shelved while conducting the study (Fischer, 2009).

The researcher's role in the organization could also have resulted in self-selection when the participants who volunteered were those who were comfortable in speaking to this researcher. Some of the employees might have concerns that they could be easily identified by directly quoting their words, even though the researcher de-identified their names by using pseudonyms. To address this concern, the researcher explained the purpose of the research and obtained consent before proceeding with an interview. One way to reduce the bias was to

conduct a one-on-one meeting with each participant in an area that was out of sight from other frontline staff. First, the researcher transcribed each interview script immediately post interview. Next, the researcher checked for accuracy by listening to the taped conversation and matched it against the transcription. Finally, the researcher provided the transcripts to the participants for member checking.

Research Sample

The sampling strategy was to recruit individuals until saturation of the main themes was achieved. Saturation refers to gathering data until the themes are saturated and gathering fresh data will no longer reveal new properties (Creswell, 2014). The researcher was limited by the number of eligible participants enrolled in the study during the data collection period. The researcher used purposive sampling to enroll information-rich participants who could best describe their experience in taking care of patients at risk for a fall. Clinical practitioners with expertise in caring for patients with high fall risks were considered "information-rich" with respect to the purposes of this study, and they were chosen based on the type of profession. In a rehabilitation setting, these clinical practitioners consisted of professional and licensed staff – nurses and therapists; and assistants such as nursing technicians and rehabilitation technicians.

The research question focused explicitly on the frontline staff and their experience in fall prevention. Using the IPA sampling methodology (Smith et al., 2009), the researcher used a purposive sampling strategy to recruit a relevant group of participants. For this reason, the researcher limited the interviews to frontline staff who work with patients on mobility issues such as transferring of patients, assessing mobility functions, and assisting patients with ambulation. The first phase of recruitment was a census sample through electronic mail (email) using the script, as shown in Appendix B. This ensured each eligible frontline staff member was

given an opportunity to participate. The researcher had access to the email address of each relevant discipline at Hospital A and Hospital B through permission from the senior management of the organization and Information Systems department. As for Hospital C, the researcher sent a recruitment email to Hospital C rehabilitation leaders who, in turn, forwarded the email to their staff. The email phase of recruitment generated only seven participants. The researcher then approached the frontline staff in person using the same script as the email and recruited eight more participants. These participants recommended their colleagues, and the researcher recruited them by sending a personal email with the same script. The researcher interviewed a total of 24 participants for this research.

For the frontline staff, the professions with direct involvement in fall prevention protocols were nurses, nursing technicians, physical therapists, occupational therapists, and rehab technicians. The researcher used purposive sampling to select the frontline staff for a good representation of the different disciplines as well as the different shifts for nursing staff. The sample frame consisted of 143 nurses, 78 nursing technicians or care partners, 16 physical therapists, 22 occupational therapists, and eight rehabilitation technicians. The staff participants were selected based on the types of profession and the shifts that they work at each hospital: three Registered Nurses (RN) or Licensed Practical Nurse (LPN) representing day shift, night shift, and weekend, one nursing technician, one physical therapist, one occupational therapist, and one rehabilitation technician. The researcher excluded speech-language pathologists from the pool of participants because that was one discipline within therapy that usually saw patients in an office and did not encounter as many mobility issues as compared to the other disciplines. Besides their expertise in caring for patients with mobility issues, the researcher also looked for participants with more than six months of work experience with the organization. Generally,

employees who had been with the organization for about six months would have experienced the culture of the organization by interacting with their team members.

The researcher informed each discipline about the study and recruited participants for the study via email memo script as shown in Appendix B. This email was sent out to nursing and therapy staff with a goal to recruit about 21 staff participants representing the different hospitals, different professions, and different shifts. The employees who indicated that they were willing to participate in the study were educated about the interview process before obtaining informed consent. None of the participants opted out after the explanation. The recruitment goal was between five to ten percent out of a total of 267 available numbers of eligible participants, and the final number of participants was 24. Unfortunately, one of the participants had only been with the organization for two months and had to be excluded from analysis due to the criteria set for the participants. Table 2 below summarizes the number of available participants, the recruitment goal, and the final number of recruited participants.

Table 2

Sampling Table

Frontline Staff	**Number in Population**	**Goal to Recruit**	**Number Recruited**	**Number Excluded**
Nurses	143	9	8	1
Nursing Technicians	78	3	5	0
Physical Therapists	16	3	5	0
Occupational Therapists	22	3	3	0
Rehabilitation Technicians	8	3	2	0
Total Frontline Staff	267	21	23	1

For this research project, the participants were recruited from the organizational chart of each hospital as shown in Figure 6.

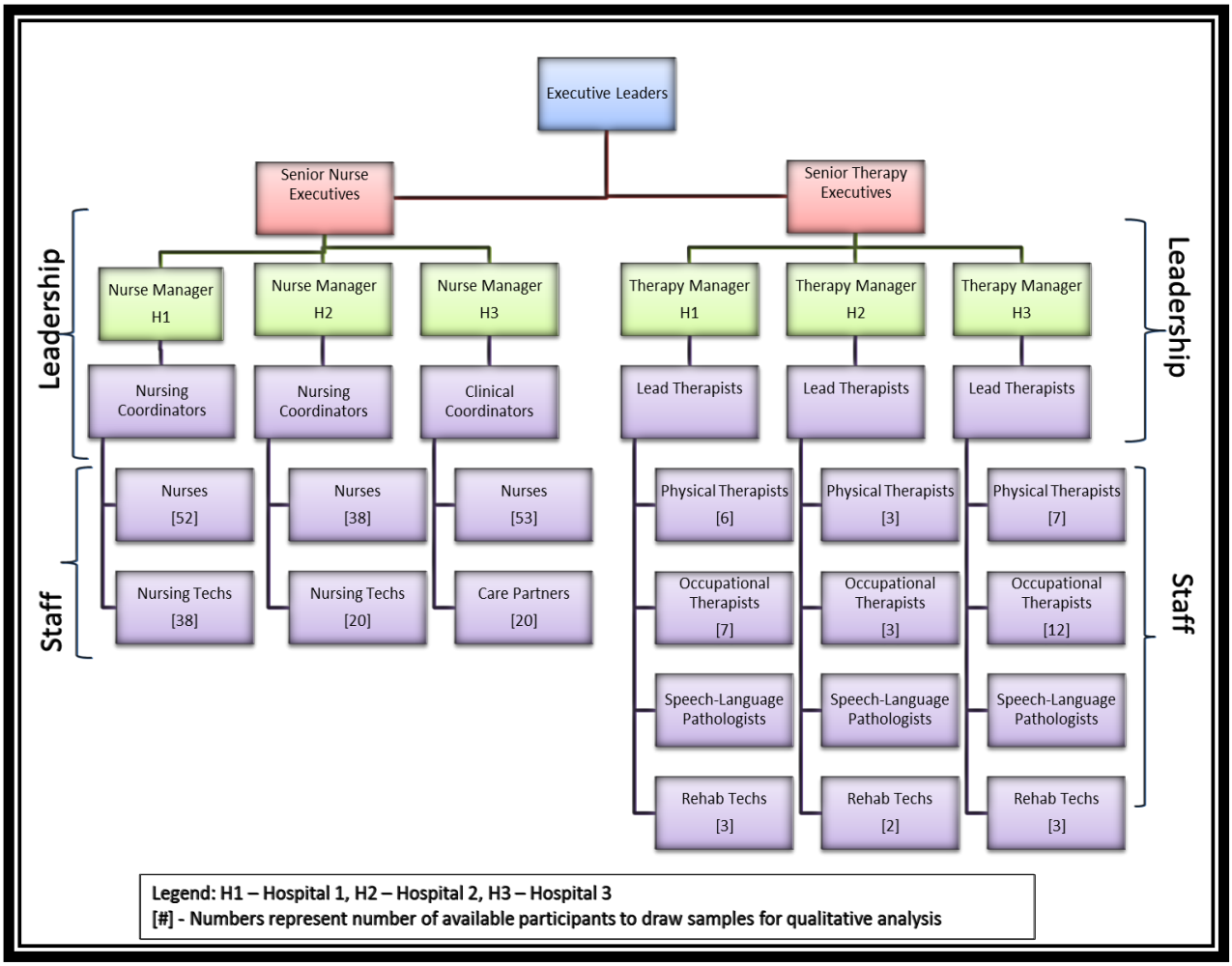

Figure 6. Organizational Chart of All 3 Hospitals. The numbers in the bracket represent the number of available participants from which to draw samples.

The researcher assigned each participant a study number. Before the start of the interview, this researcher asked the participant to fill out the form containing demographic questions such as his or her profession, the hospital he or she works in, education level, years of experience in his or her profession, and years of experience working in the current unit. This data was collected by noting them down on a form instead of recording the voice of the participant to protect their confidentiality. The researcher used this demographic data in her key, which was a separate spreadsheet that had the name linked to a study number. The researcher kept the key containing demographics data separately in an encrypted file stored in her computer and

protected using a password. The dataset used in the data analysis consisted of study number or pseudonyms. The purpose of the key was to allow the researcher to trace back to the participants in case there was a need to seek clarification after transcribing the data.

Procedures

The first step in the data collection process was to obtain informed consent from each participant. The consent form was adopted from Virginia Commonwealth University Institutional Review Board (VCU-IRB) and can be found in Appendix C. The protection of participants' human rights was essential so that their safety and wellbeing would be safeguarded throughout the study. The researcher provided a brief discussion during the recruitment and then offered this written informed consent to the participants to sign before an interview. The informed consent explained the risks and benefits of being part of the study and the nature of data protection. The participants were assured that their names would not be associated with the research findings in any way, and only the researcher would know their identity through the key document, and only the researcher would know if they even participated. To protect their confidentiality, each participant was de-identified by using pseudonyms. The researcher used the letters ("FL" = frontline staff) and a number based on the sequence in which interviews were conducted to maintain the confidentiality of the participants. For example, "FL2" is the second frontline staff interviewed by the researcher. The data were aggregated but not distinguishable by hospitals. If they were distinguished by hospitals, their identity might be at risk of being identified. Participants had the right to decline participation in the study and were informed that there would be no repercussions if they wished to withdraw from it at any time.

Each participant met at an appointed time in a conference room at the hospital campus or a designated office. The researcher asked a series of open-ended questions based on the research

question and specific aims as shown in Appendix D. The researcher was mindful of the way the interview was conducted as there was a risk of participants feeling uncomfortable during the interview process. The participants may have feelings of guilt or remorse when reflecting on their experience caring for patients who fell at the hospital. This was avoided by using techniques from appreciative inquiry (Cooperrider, Whitney, & Stavros, 2008), advanced interpersonal communication skills, open questions, allowing the participants to have time to detail their experiences without interruption and allowing the participants to ask questions during and after the interviews. Although the researcher had conducted interviews before, this researcher was trained in systematic interviewing techniques by Dr. Laurie Cathers, an interviewing expert before the start of the study. Dr. Cathers also conducted a bracketing interview with the researcher to explore the impact of the researcher's personal and professional experiences with the research topic during data collection and analysis. The bracketing interview also served to mitigate the potential bias effects of preconceptions that may influence the research process.

The researcher used a digital tape recorder to audiotape the interview and transcribed them verbatim. Next, the researcher compared the accuracy of the typed verbatim report with the audiotape to correct any transcription errors. After correcting transcription errors, the researcher sent a draft copy to the participant for member checking so they could check the accuracy of the account and informed of any missing information. All participants were given a unique identifier or pseudonym, and these were only known to the researcher. Nothing written in this final report could in any way identify a particular participant. All information, including recorded tapes of interviews using digital recorders, was kept in a locked filing cabinet in the researcher's locked office and would be destroyed at the end of the researcher's matriculation per the VCU IRB

guidelines. The key containing demographic and identity of participants would also be destroyed. While there was no physical intervention involved with this research, discussing and thinking about their situation could have induced psychological problems, such as depression. The participant could have felt guilt or remorse over not doing enough to prevent a fall. With this possibility in mind, the researcher provided written information on how the participants could contact their organization's employee assistance programs for support afterward if required.

Data Analysis and Synthesis

The challenge throughout data collection and analysis was to make sense of large amounts of data, reduce the volume of information, identify significant patterns, and construct a framework in this regard (Bloomberg & Volpe, 2008). The questions asked in the interview explored the perceptions of employees about the dimensions of safety culture as they related to barriers and facilitators of fall prevention protocols. Results of the qualitative analysis would identify the themes that the staff believed to influence their efforts in fall prevention and how their organization supported patient safety. Responses from the participants were coded according to the standard principles of interpretative phenomenological analysis (Smith, Flowers, & Larkin, 2009). The researcher coded the transcripts at the descriptive level and conceptual level (Friese, 2014). In the descriptive level, the data was explored to look for similarities and differences (Friese, 2014). This data resulted in a structured code list, which could then be applied to the rest of the data during second-stage coding (Smith, Flowers, & Larkin, 2012).

Typical statements made by the participants and interview data were presented in indented blocks to support conclusions drawn through analyzing the data. Minimal editing was done to preserve authenticity while ensuring readability. Ellipses (...) were used where irrelevant information was deleted from a quote. Clarifying information was added to the participant's

words in square brackets ([ ]), where necessary. Once the data was coded, this researcher did a conceptual level analysis by looking at the data from the perspective of the research question and analyzed for themes gathered from the interviews. These themes were then used to understand the phenomena. These new phenomena were then compared with the high reliability theoretical model by Weick and Sutcliffe (2001) to see if any or all of the five components of High Reliability Organizations (HRO) were also present.

Ethical Considerations

The researcher had to respect the study site as the participants have their full-time jobs, and most of them were caring for patients. Minimal disruption to their work schedule must be considered when scheduling the interviews. Due to the sensitivity of the questions and answers, each participant was interviewed on a one-on-one basis to protect their confidentiality and to reduce bias. Participants may have perceived power imbalances, and the researcher was mindful not to use leading questions, withheld personal views on the subject, and avoided disclosing sensitive information (Creswell & Poth, 2018). During the interviews, questions were phrased in a positive tone to foster a healthy and trusting relationship and to assure the participants that their perspectives were valuable in this research.

When analyzing the data, the researcher had to avoid taking sides with the participants or adding in personal bias and disclosing only positive results. It was essential to incorporate findings from multiple perspectives and report both positive and contrary findings (Creswell & Poth, 2018). One ethical issue to avoid in the final report is the unintentional disclosure of information that can harm the participants. Instead of reporting by the individual story, the researcher used composite stories to de-identify individuals.

Reliability and Validity

In qualitative research, issues of validity and reliability were addressed by establishing trustworthiness (Bloomberg & Volpe, 2008). Validity refers to the degree to which something is measuring what it is supposed to measure. Reliability refers to the extent to which there is consistency in the measurement. Therefore, a qualitative researcher needs to control for potential biases that might be present throughout the design, implementation, and analysis phases of the study (Bloomberg & Volpe, 2008). Lincoln and Guba (1985) presented four criteria, namely credibility, dependability, confirmability, and transferability, to establish trustworthiness in qualitative research and added a fifth criterion of authenticity in 1994 (Cope, 2014).

Credibility. Credibility suggests that the findings and interpretation of data are accurate, truthful, and credible from the views of the participant, researcher, and reader (Lincoln & Guba, 1985). Upon completion of transcribing each interview, the researcher sent the transcript to the participant for member checking. The purpose of member checking was for the participant to validate and verify that the transcription was accurate. A few of the participants responded to the researcher to correct grammatical mistakes and clarify some of the terms used during the interview. Thus member checking, also known as respondent validation, was an essential process for the participant to verify research findings and confirm or challenge the accuracy of the work (Creswell & Poth, 2018).

Dependability. Dependability in qualitative research is equivalent to reliability in quantitative research, in which research findings can be replicated with other similar studies. According to Lincoln and Guba (1985), the findings must be consistent and dependable with the data collected. Therefore, the researcher documented the procedures thoroughly at each stage of the research process by writing memos. This researcher analyzed each quote from the participant

and used consistent codes and categories and demonstrate consistency in the coding schemes and categories used for each interview (Bloomberg & Volpe, 2008). For each code, the researcher kept records of memos to document the rationale for all choices and decisions. The codes were replicated in multiple transcripts because the participants related similar experiences. A study is deemed dependable if the study findings can be replicated with similar participants in similar conditions (Cope, 2014).

Confirmability. Confirmability is equivalent to objectivity in quantitative research. The data must represent the participants' responses and not the researcher's biases or viewpoints (Cope, 2014). One important point to note is that this researcher is an employee of one of the organizations and has a close working relationship with most of the participants. The researcher conducted preliminary informal interviews with 16 potential participants including 11 leaders and six frontline staff to find out if they would feel comfortable discussing preventable patient falls with her, and all of them had indicated they were comfortable with being interviewed by the researcher. However, there was still the risk of unconscious bias, which was a significant risk for the researcher and could influence how the researcher queried the participants or interpreted their responses (Creswell, 2014). To account for that, one of the committee members of the dissertation committee, Dr. Laurie Cathers, conducted a bracketing interview with the researcher to provide feedback about limiting bias (Smith, Flowers, & Larkin, 2012). The questions used in the bracketing interview are listed in Appendix F. The aim of the bracketing interview was to get at the conscious experience of the researcher on the topic of patient falls (Smith et al., 2012). Bracketing centers on suspending beliefs so that as a researcher, she can go into the field with no pre-conceived attitudes, beliefs, or opinions about the subject of fall prevention. Also, Dr. Cathers audited a mock interview before the start of an actual interview and offered advice on

the interviewing technique. Dr. Cathers randomly audited the transcripts of a few random interviews to ensure consistency in interview questions.

Transferability. Transferability is synonymous with external validity in quantitative research in which the research findings can be applied to other situations, time, populations, and contexts (Lincoln & Guba, 1985). The findings are transferable when the readers can associate the results with their own experiences (Cope, 2014). Lincoln and Guba (1985) suggested providing a thick and rich description of the phenomenon. The thick description refers to a technique in which the researcher provides a robust and detailed account of their experiences during data collection (Bloomberg & Volpe, 2008). The researcher wrote journals to document her thoughts about the interviews with each participant.

Authenticity. Authenticity refers to the ability and extent to which feelings and emotions of the participants are expressed genuinely rather than being masqueraded or copied (Cope, 2014). In the next chapter of analysis, the researcher explained the meaning conveyed by the participants, followed by their verbatim quotes so that a reader can grasp the essence of the experience through quotes from the participants.

Bracketing Interview

Dr. Laurie Cathers, a dissertation committee member, completed bracketing interview with the researcher on November 30, 2018. The bracketing interview explored the reasons the researcher chose this particular topic and how it related to this researcher's personal working experience with patient safety programs and fall prevention. The researcher's passion for patient safety sparked from the experience the researcher had while working at other healthcare organizations in which patient safety programs were driven by top leadership. The researcher experienced first-hand how a well-designed patient safety program transformed the way frontline

employees embraced the culture of safety. The researcher began her healthcare career as a medical technologist working in the laboratory as a frontline employee and then progressed up to leadership roles as a quality and risk manager. The researcher's working experience helps her relate patient safety through different lenses. Specifically, her role as a risk manager allows her the opportunity to analyze how errors happened and how the team came up with solutions to prevent errors.

The researcher is a strong advocate for a culture of transparency and a culture of accountability. She observed that different disciplines were working in silos and having silo thinking. If all disciplines could integrate their knowledge and share their expertise with one another, then there is true teamwork. Personal accountability is a key factor to success. If there is intrinsic motivation, there is a tendency to embrace the culture of safety (Wachter, 2013). Teamwork is also important as groupthink is a psychological phenomenon in which a group of people either conform to the social norms or they can have dysfunctional decision-making (Edmondson, 2002). The researcher believed all levels of the organization need to embrace the culture of safety, starting from top leadership.

Unlike acute care hospitals in which the Centers of Medicare and Medicaid imposes many incentives, as well as penalties for quality and safety, inpatient rehabilitation facilities (IRF), are not held to the same level of accountability. Nevertheless, IRFs do focus on patient safety, such as fall prevention and pressure injuries, which are more prevalent in their setting. In this study, the researcher specifically focused on fall prevention because of her experience as a risk manager in various hospitals in which she found variations from policy to actual implementation. She was puzzled as to why preventable patient falls continue to happen despite all preventive measures in place. As the researcher reviewed literature related to patient safety

culture and fall prevention, she noticed a gap in the literature that links patient safety culture to fall prevention in the rehabilitation setting. This gap in knowledge was re-enforced when she found through root cause analyses that frontline employees circumvented the policy or protocol and spread it to other co-workers, thus, creating normalized deviance. Normalized deviance is hard to detect until an error happens. In practice, there is a lot of variation, and many factors can cause deviation from policy. The researcher sought to find the barriers and facilitators of fall prevention through this qualitative research by interviewing the frontline employees.

The researcher acknowledged her working relationship with the study sites and her familiarity with most of the participants. Her passion for patient safety and her working knowledge could be an advantage and a disadvantage. It was an advantage in that she could relate to the terms that the participants use. On the other hand, it was a disadvantage because the participants might perceive that she knew their thoughts and experience, but she has no direct experience as a nurse, a therapist, or a technician. The researcher had to be mindful during the interviews, not to intermingle her working role and the researcher role. Thus, the researcher prefaced it by informing the participants that she was assuming the role of a researcher and reminded herself to ask for clarification of terms. During data analysis, the researcher had to keep an open mind and not focus on the themes that she already knew or that she anticipated would be included. She had to read more into what the participants were saying and their ideas.

Chapter 5

Analysis and Results

Introduction

The interviews were transcribed and analyzed following the interpretive phenomenological analysis (IPA) process. First, the researcher read each transcript to gain a deeper understanding of the participant's experiences with patient safety culture and their perception of the prevention of fall. At the same time, the researcher reflected on the interview and wrote memos to note the specific thoughts and feelings that the participants shared during the interview. Through reading and re-reading the transcripts, the researcher was able to actively engage with the data and notice the similarities, contradictions, and paradoxes amongst the participants. This act of reading and re-reading to gain more understanding also involved sensing the impressions and various perceptions by the participants. Then, the researcher used words or phrases as codes to summarize the theme in each segment of the interview question. For example, when the participants described how they approach others who performed an unsafe act, this researcher used the code word "approach" and then attached other themes such as "non-confrontational" and "coaching" to indicate the differences in how they react towards their peers.

Next, the researcher identified the emergent patterns and created memos to capture her thoughts and understanding of the participants' viewpoint. By combing through each code, this researcher combined some codes with similar themes into one group. For example, the participants related how they collaborate with one another using words such as "good teamwork", "joint interdisciplinary", and "good relationship", this researcher then combined all

descriptions into one emerging theme called "culture – collaborate with one another." The list of codes is shown in Appendix H. From the list, the top three codes with the highest counts were staffing issues (19 counts), communication (17 counts), and teamwork (14 counts).

Finally, this researcher developed a structure or framework to illustrate the relationships between the themes (Smith, Flowers, & Larkin, 2012). Once a set of themes was established with the transcript, they were put in chronological order. This researcher then compared the themes across all transcripts and mapped the parallel and similar themes together to form super-ordinate themes. These themes matched up to those used by the Agency for Healthcare Research and Quality (AHRQ) in the patient safety culture survey.

This chapter follows the strategies above and includes:

1) Super-ordinate Themes and Themes Overview;

2) Overview of Patient Safety Culture;

3) Roles of Participants in an Interdisciplinary Team;

4) Super-ordinate Theme 1 Analysis: Perception of Patient Safety Culture;

5) Super-ordinate Theme 2 Analysis: Education and Training of Fall Prevention Protocol – Preventable versus Non-Preventable Falls;

6) Super-ordinate Theme 3 Analysis: Teamwork: Within Disciplines and Across Disciplines;

7) Super-ordinate Theme 4 Analysis: Communication;

8) Super-ordinate Theme 5 Analysis: Staffing;

9) Super-ordinate Theme 6: Leadership Support;

10) Super-ordinate Theme 7 Analysis: Ideas on Strengthening Interdisciplinary Effort to Promote Patient Safety; and,

11) Summary.

The themes in the AHRQ patient safety survey are: overall perception of patient safety; supervisor/manager expectations; leaders' action promoting safety; organizational learning; teamwork within unit; communication openness; feedback and communication about error; nonpunitive response to error; staffing; management support for patient safety; teamwork across hospital units; and handoffs and transitions (Sorra, Gray, Streagle, & et al, 2016).

Super-ordinate Themes and Themes Overview

The researcher analyzed, coded, and summarized the themes drawn from the transcripts. For each interview question, the researcher assigned codes to capture the conceptual meaning of the participant's description. In accordance with the hermeneutic circle, the researcher grouped the codes to form themes that were interpreted as relevant to the specific aims of the study and how they relate to the research question (Smith et al., 2009). Then, the researcher abstracted similar themes and developed a new name for the clusters to form themes. The themes with similar meanings were consolidated to form super-ordinate themes. Super-ordinate themes are actually formed by putting similar themes together and creating a new name for the cluster (Smith et al., 2012). Finally, the researcher used the super-ordinate themes to create a graphic representation of the structure of the emergent themes as shown in Figure 7 below:

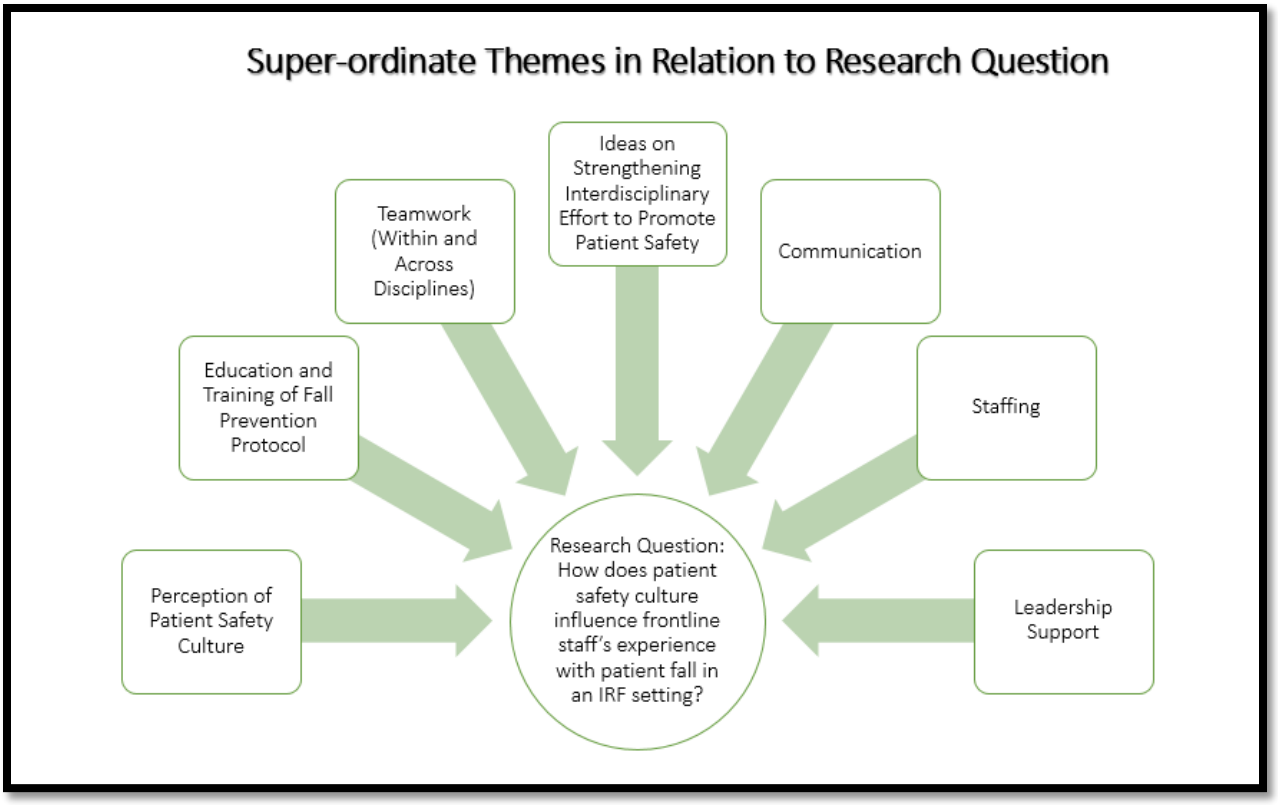

Figure 7. A graphic representation of the structure of the emergent themes to form super-ordinate themes in answer to the research question.

Super-ordinate themes were formed from analyzing opposing views between the emergent themes, known as polarization, and merging views, known as subsumption (Smith et al., 2012). For this research, the polarizing views were grouped as barriers and facilitators. The researcher took account of the frequency of similar themes that emerged among all 23 interviews. Such numeration was one way to indicate the relative importance of the themes. As a result of the analysis, seven super-ordinate themes emerged across the 23 interviews. Within the seven super-ordinate themes, there were sub-themes of barriers and facilitators. This researcher then matched the super-ordinate themes to the specific aims of this research. The interpretive process is presented in Table 3.

Table 3

Interpretive process for super-ordinate themes and specific aims

Research Question:
How does patient safety culture influence frontline staff's experience with patient fall in an inpatient rehabilitation hospital (IRF) setting?

Specific Aims:
1. This research seeks to ascertain if patient safety culture influence adherence to fall prevention protocol.
2. To explore the special challenges faced by frontline staff in an IRF setting when taking care of high fall risk patients.
3. To identify the factors perceived by frontline staff that has impeded or continue to hamper their ability to prevent falls.
4. To explore the definition of patient safety culture through the lens of frontline staff.
5. To recognize the recommendations from frontline staff on how an organization can successfully integrate patient safety culture into their workplace.

Super-ordinate Theme	Sub-Themes	Specific Aims
#1 – Perception of Patient Safety Culture	• Perception of staff on general safety • Perception of staff on fall prevention	Aim#1 Aim#4
#2 – Education and Training of Fall Prevention Protocol	• Fall prevention protocol and education of fall prevention • Preventable • Non-preventable • Patient characteristics	Aim#1 Aim#2
#3 – Teamwork	• Interdisciplinary collaboration	Aim#1 Aim #3 Aim #4
#3A – Teamwork within discipline	• Barrier – Personality differences • Barrier – Perceived power distances • Facilitator – Good teamwork	Aim#1 Aim#2 Aim#3 Aim#4
#3B – Teamwork across disciplines	• Barrier – Differences in opinions • Barrier – Work in silos • Barrier – Lack of cross-sharing responsibilities • Barrier – Differences in personalities • Facilitators – Good teamwork, Respect	Aim#1 Aim#2 Aim#3 Aim#4

Super-ordinate Theme	Sub-Themes	Specific Aims
#4 – Communication	• Handoff and Transitions • Barrier – Lack of consistent interdisciplinary communication • Facilitator – Effective communication within team	Aim#1 Aim#2 Aim#3 Aim#4 Aim#5
#5 - Staffing	• Staffing efficiencies • Sharing burden of care • Time constraints • Unscheduled absences • Level of experience • Fatigue	Aim#1 Aim#2 Aim#3 Aim#4
#6 – Leadership Support	• Barrier - Hold Staff Accountable • Barrier – Inconsistent Process in the Organization • Barrier - Budget Constraints • Barrier - Physical Space • Barrier & Facilitator – Equipment • Facilitator - Supportive and Trust • Facilitator – Recognition	Aim#1 Aim#4
#7 – Ideas on Strengthening Interdisciplinary Effort to Promote Patient Safety	• Communication • Process • Education • Interdisciplinary Collaboration • Leadership	Aim#1 Aim#5

Overview of Patient Safety Culture

The cultural and social context within which an organization operates defines the culture of the organization. Organizational culture is reflected in the way the team members interact with one another, their patterns of behavior, and their shared norms, values, and beliefs (Chassin & Loeb, 2013). Leadership plays a role in shaping the culture by creating and maintaining a culture of safety.

This research study provides the opportunity to explore the participants' perception of the culture of patient safety in their organizations. From the interviews, this researcher gathered that

every participant embraced patient safety as a number one priority with their patients and patients' family. They described patient safety, especially the prevention of falls, as a value that was so much ingrained in them that it had become part of their culture to check for safety. Leadership put in place visible cues such as posters on fall prevention, signage such as "falling star" to denote high fall risk patients, and caution signs to alert patients and families. The participants valued good teamwork and enjoyed learning from each other. Culture also built on consistency in practice in which new employees who came on board would follow suit. However, disharmony in teamwork might occur when different personalities clashed with one another, resulting in conflicts which could cause patient safety issues.

Role of Participants in an Interdisciplinary Team

The participants were asked to describe how they view their roles within an interdisciplinary team and what expertise they contribute towards the team. Their perception provides a perspective on the pride of their profession.

Nurses. The nurses describe themselves as patient advocates and "all things to all people." They are responsible for the physical, emotional, and social needs of the patients. Their main functions include medication administration, pain management, assessing the cognitive status of patients, monitoring nutrition intake and output, assessing bowel and bladder functions, and wound care.

> I think the expertise of the nurses, it really is more of the care given in terms of medication, in terms of wound care and … how the patient eats or how they consume their intakes and because the therapist might be there but not necessarily monitoring everything nurses do. …, generally their needs; …, a physical need and also maybe, emotional, social needs. (2:23)

Therapists. Physical therapists assess the functional ability of the patients to determine their mobility status. Their expertise is in balance and mobility, advising other disciplines on patient's transfer status, and assessing patient's ability in walking stairs and use of wheelchairs. They also order durable medical equipment such as wheelchair and walkers for patients to be used post-discharge. Other disciplines look to them to establish the patient's transfer status.

> … So, in order to send someone home, they have to be able to get inside their house. So they have to be able to do stairs, they have to be able to move around their house, however, they do that, whether that's in the wheelchair, which we have to teach them and get for them, or whether it's walking, which we have to teach them strategies and then teach their family. (6:13)

Occupational therapists show patients who experienced physical and cognitive changes some self-care skills so that they can be more independent. In the rehab setting, patients practice performing activities of daily living with occupational therapists to regain their functional status. They teach patients how to use adaptive equipment and provide guidance on how to safely transfer themselves from one level to another, such as from bathtub to a wheelchair.

Nursing Assistants. The job titles of nursing assistants may differ from one organization to another, namely nursing technician at Hospital A and Hospital B, and patient care partner at Hospital C. However, from the descriptions of their roles, they perform similar functions. A nursing assistant performs tasks such as taking vital signs, bathing patients, assists patients with transfers, toileting, and other activities of daily living. They described their role as the first responder when a patient calls for assistance. Since they are with the patients most of the time, they have to be mindful of their psychosocial issues as well.

To help in making sure that the patient is safe. …we're making sure that the patient has a call bell and also being toileted …, at whatever hours that they need to go to the bathroom. (16:16)

***Rehabilitation Assistants*.** Similar to nursing assistants, rehabilitation assistants are called rehabilitation technician at Hospital A and Hospital B and referred to as rehabilitation aides at Hospital C. They described their role as assistant to the therapists and performs duties assigned to them by the therapists such as assisting with transferring of patients and walking the patients.

…, we are pretty much the jack of all trades. We help where we're at, with pretty much anything that the therapists require of us, … (9:20)

Super-ordinate Theme 1: Perception of Patient Safety Culture

The patient safety culture of an organization can be drawn from the way the staff interacts with each other and how they approach the other disciplines when they see an unsafe act. There was a consensus among the participants that patient safety was at the core of their daily functions. Every participant acknowledged that patient safety trumped other priorities. One of the interview questions asked about their approach in correcting someone whom they observed had not applied the proper safety measures on the patients. Based on their style of approach, two sub-themes emerged on their perception of the culture of safety. One was their reaction on general safety and the other specifically for fall prevention. How the participants defined patient safety culture in their own terms answered Specific Aim 4: To explore the definition of patient safety culture through the lens of frontline staff. In addition, the participants' approach on how they correct an unsafe act provided answers to Specific Aim 1 which was to ascertain if patient safety culture influence adherence to fall prevention protocol.

Perception of the Staff on General Safety

When observing someone performing the wrong act, FL1, who was a nurse, would step in and coach them to do it the correct way. She was comfortable in advising all disciplines regardless of their profession as she believed everyone was on an "equal playing field."

> … I think you can try and change the mindset of this is just solely my job, that it's not my silo. I work really well with the other support staff. And so, I have no problem telling him, therapist, "Hey, I think you forgot to do this." or if it is a physician, "Hey, I think you forgot to do it this way." I think if we have good communication, I don't think it's ever a punitive or educational issue. I think it's just a friendly thing. … there's not … a hierarchy and the nurses at the bottom and, the therapists and the physician, … we are all equal playing field. (1:17)

If someone did something wrong, FL2 would coach them by subtly showing them the correct way. She preferred to do it together with the person.

> I would probably just hover over them, …, especially if a physician transfers a patient that is going to be a little bit strange. … I would … be appreciative and be nice, "Hey, come on. Let's do this together." Because this is … not strange that people do not know. We are all learning. (2:18)

FL10, an occupational therapist, would redirect the person who was doing something wrong. She would coach them to do it the correct way by using subtle hints and subtle cues.

> … I would probably stop them if they were trying to do something that they shouldn't be doing. … And then I will, …, subtle hints, subtle cues without pointing out like, "Hey, do this," …, because they don't want to hear me be their authority figure, either. … sometimes it's better received than be told what to do. (10:16)

Likewise, FL16, a nursing assistant, was not afraid to speak up and would also participate in demonstrating what needed to be put in place.

> …, and I also put the bed alarm on. (16:15)

Some participants were hesitant in approaching others to correct them. It would depend on who it is. If uncomfortable in approaching the person, FL13, a nursing assistant, would report to her leadership instead.

> … Personally, it would depend on who it is. … we have communication with our rehab nursing leadership. So I think it will be easier to talk to them so they can talk to that discipline. (13:11)

Another nursing assistant, FL7, would not hesitate to speak up and point out errors when it comes to patient safety. She wanted to make sure the patient was safe.

> … because it's all about the patient. It's not like, … they're my friend, I am not gonna tell them this … we just need to make sure that patient safety is first. (7:11)

FL15, a rehab assistant, preferred to approach others to see if they needed help and offered assistance.

> …, if you notice that they're not doing it right, it would be good to come in and just ask, "Hey, you guys good? Do you need me to do anything to help out?" (15:10)

FL17, a nurse, would not hesitate to help and would step forward and take over.

> I would have already stepped in front of them and say, "Hey, I know you're really busy. Thank you so much for helping." But, I would not have let a patient be transferred incorrectly. (17:18)

FL18, a physical therapist, stated that in the culture of her organization, there was an expectation to cover each other's back. Therefore, FL18 was not afraid to step in and correct if someone did it wrong.

> Well, I think it's expected of us to do that … there have been a few circumstances that I felt like I had to step in, and I did step in and try to correct. Sometimes it's received well, and sometimes it's not. (18:11)

Staff Perception of Fall Prevention

In a rehabilitation setting, all patients are considered to be at a higher risk of falling. Thus, the frontline staff pays more attention to fall prevention. It is part of the protocol that when a patient falls, a group of clinicians will gather to assess the situation and conduct a post-fall huddle.

When participants were asked how they would react when someone did not apply the correct fall prevention measures, they offered their opinions on how they would approach the person. FL2, a nurse, suggested a non-punitive approach. She believed in first, understanding the root causes of the fall before penalizing the nurse or nursing assistant who was caring for the patient. Sometimes a fall was not due to negligent care but rather, other environmental issues or patient non-compliance. It was essential to hold each other accountable. Constant reminders and extending suggestions to the nursing assistants might also help.

> When we do follow-ups, … at least they have someone else tally behind this fall and not for malicious intent that you're going to attack the person or … the department that has more falls. Or maybe you're going to give help more to the people who did it and ignore the ones who did more falls but with the intent of just finding out information. … when someone falls under your care, we have the feeling that "Oh, maybe they will

look like it is my fault." So, sometimes, that's why some people will pretend to hide it or that I have seen it here. The last case I heard of, it was like four months, five months that the patient is saved. They fell in some tape to the mat [the patient tripped over the tape that was on the mat], but it was impossible because that person was too big to be picked up by one person. (2:32)

FL3, a physical therapist, would use a non-confrontational approach to correct someone who was not taking the proper precaution with high fall risk patient. She would pull the person aside to remind her co-worker of the fall preventive measures.

> But I would try to, …, come across as very non-confrontational and say, "Hey, … when you are with this patient, …, X, Y, Z happened, and you didn't lock the wheelchair, you didn't put the belt on, or, … you're a little bit too far away from the, whatever the situation is", and just remind them that patient is at risk of falling, and then we need to take steps to keep them safe. …But I would hope I would be able to approach them and have a very similar conversation about it when I'm not criticizing them, but just remind them that we're all looking over patient safety first. (3:8)

FL8, a nursing assistant, would discretely remind others if she caught them doing something wrong.

> You're trying to do the best you can, but you are only human, and you got so many things, … just try to focus on that one patient that you have when you're in that room. …, just for that little bit of time, let me check all the boxes and ... "Dr. xxx, you know, you forgot to buckle the seatbelt [in whispering mode]." (8:13)

FL12, who was a nurse educator, felt that new nurses might not feel as comfortable speaking up than therapists in pointing out the correct way to transfer a patient because it is the

therapist's expertise. Therapists also teach the patients how to transfer correctly, and a nurse needs to follow the same technique.

> … staff is so new; they don't have that comfort level to say, "Hey, wait a minute, that's not the right way, can we try it this way, this is how it is supposed to be." I would say probably 50-50 on my staff feeling comfortable approaching somebody saying, "Wait a minute, that's not the right way." Now, as far as therapy, therapy is really good at it. So, if I were to be transferring wrong, and they come into the room, … "Wait a minute, xxx, that's not the right way, let's do it this way so that we don't have a problem." And I feel like our patients are really aware of that. And I think that we educated them so well, so, if I went into a patient room and started doing it the wrong way, I think the patient would say, "Hey, wait a minute, this is not normally how they would transfer me." And we tell them that in our therapy sessions, "This is your transfer, this is the safe way until I tell you differently, this is how it needs to be." So, anybody that enters the room, if I go into a room and I don't know the patient, I always ask them, "So, how are you transferring?" instead of jumping the gun and doing whatever. (12:12)

FL21, a nursing assistant, would approach the person and educate them as she felt personal accountability if the patient were to fall.

> I will most likely just say, "Hey, next time, make sure you have a gait belt on them or if you're putting them on in the bed, make sure their bed alarm is on because if they get up and fall ultimately, it is on us." …, I don't want to take the heat for someone else's irresponsibility. (21:8)

Super-ordinate Theme 2: Education and Training of Fall Prevention Protocol – Preventable versus Non-Preventable Falls

Super-ordinate theme two relates to the fall prevention protocol and how the frontline staff was trained on the protocol. The participants were also asked to describe their definition of preventable and non-preventable falls. Information gathered from the participants provides the answers to Specific Aim 2: To explore the special challenges faced by frontline staff in an IRF setting when taking care of high fall risk patients.

Fall Prevention Protocol and Education of Fall Prevention

The nurse's risk assessment for falls is the first step in determining the fall risk status of the patient. Based on the scores of patient's functional capacity, history of falls, and cognitive status, the patients are then grouped under different categories of risk such as "monitor", "fall risk", and "high fall risk" groups. The nurses and nursing assistants would then place signage and indicators such as fall risk armband to alert other staff. FL5, a nurse, summed up the process in the quotation below:

> When the patient is first admitted, we have fall risk groups and based on your assessment; you put that patient in a group whether it is a Monitor group, a Fall Risk group, or High Fall Risk group. If …we find that it is a high fall risk group, there are certain things we implement such as on a wheelchair we put … a yellow band, it … alerts the whole team that this patient is a high fall risk. We put falling star type of thing in the rooms, …, and we put a fall risk band on them. So, everybody … alerts everyone on the team that this patient is a high fall risk. And then we have the ones that are just Fall Risk, …, we can put a fall risk band on them, but most of the time …, we are monitoring them. And all of our patients are, … always instructed when they are admitted, "not to get up by

themselves". And always educating them on where their call bell is at, and if for some reason, call bell falls on the floor, just call and say, "I need help." … anybody comes in the room; everybody is trained on the same fall prevention so that, …, when they come in the room, anybody can help. (5:3)

When interviewing the participants, this researcher found that the therapists and rehab assistants were not aware of the nurse's fall risk assessment. The therapists did not rely on the nurse's assessment and preferred assessing the patients on their own to determine the mobility status of the patient and how much assistance they required when transferring from one level of position to the next such as from a bed to wheelchair. FL10, an occupational therapist, described how she determined the fall risk level of the patient.

… we do a pretty decent job, there may be times where things slip through the cracks, or maybe …, the nurse deems them just a general fall risk, but really, they should be a high fall risk. And sometimes there may be a little bit of a discrepancy, and sometimes …, it can change, …, based on how much you know that patient. It is kind of hard, when you first, …, meet someone with a nursing perspective to gain a real sense of is this person a super high fall risk if I had not, …, transfer them yet, and they're just laying in the bed? …, you have to kind of go based on your report from acute care. So, sometimes you don't know enough about it until like the second day. (10:6)

Therapists did their own falls risk assessment. They did not follow what nursing has, but they do know the visual warning signs and symbols that the nurses display to indicate the fall risk level of the patient.

> we do a fall assessment for the different balance outcome measures to tell us if there was fall risk and based on those things; we have …, walker or cane or something like that to make their transfers in the room safely. (11:4)

There are differences between nursing and therapy on how they treat high fall risk patients and how they teach patients on safety precautions. Therapy's goal is to improve the functional abilities of the patient, whereas nursing's goal is to ensure they are safe on their own. The therapist is with the patient one-on-one and can assist the patient when he/she loses balance. Nurses have to take care of five to six patients at the same time and often do not have the same capacity as therapists in supervising their mobility functions. The differences in assignment of patients can present a challenge for nurses to educate patients on what is safe for them to perform on their own versus what therapists had taught them. The quotations from FL6, a physical therapist, and FL23, a nurse, illustrate the perspectives of each discipline.

> I feel like it's probably a little different between nursing and therapy. …, nursing has to deal with patients twenty-four seven, like in the middle of the night, when … they have to use the restroom versus like therapy where we're trying to push them anyway. …if someone, … is a high fall risk, …, if we're not pushing, putting our patients in a situation where their balances are challenged where they could fall, but we're being safe, then, …, we're not doing our job right. Versus nursing, that should really not put them in a situation like that at all. (6:4)

The quotation below from FL23, a nurse, shows how the patients can get mixed messages from the different disciplines. Patients may not understand why they are encouraged by the therapists to be more independent but the nurses are restricting their movement by applying many restrictions and preventive measures.

> We do work with the therapists. … the therapist basically determines how we can transfer the patients in our rooms. …, we communicate with each other about stuff, but they'll give us the safest way. And then they are a little bit riskier in the gym. So, they're allowed to do more stuff with them that we will not do in the room. So, I think that is confusing to the patient sometimes. And that's another thing that we could work on is more education to the patients. …, we keep the transfer on the board. … So, sometimes I have to remind people, because a lot of times they say, "Oh, I've been walking." "No, you've been walking in the gym, … you are not walking with us." (23:16)

Besides the differences in goals between therapy and nursing, there is also an inconsistent application of preventive measures. Therapy and nursing judgment on what precautionary measures to take are entirely subjective. FL18, a physical therapist, described how they differ in their protocol.

> …, if a therapist is recommending that a patient have contact guard assists, sometimes if a nurse knows them really well, they won't necessarily have their hand on the patient, they'll just be standing with them or similar things to that. So, there's a little bit of fudging outside of what the protocol would necessarily be. (18:3)

Physical therapists tend to challenge the patient more and not necessarily follow the same preventive steps. This may entail breaking the principles of a fall prevention protocol.

> …, if the protocol was being broken, and that the patient fell within that parameter, that would obviously be something that we could have prevented. And then sometimes I feel like the lines a little fuzzy, especially in therapy, because … like the most standard definition, all of them could technically have been prevented, because I was challenging them in a way that ended up being too hard, and that was why they fell. So, if I had not

challenged them in that way, then they wouldn't have necessarily fallen, then they wouldn't have necessarily seen the benefit. So, sometimes, I have a hard time deciding which way it goes. (18:4)

There are difficulties encountered in educating the frontline nursing staff. The mode of education affects the effectiveness of the materials taught. Most frontline staff do not routinely read their electronic mails (emails), and thus, information disseminated through email is not effective in keeping them up to date with the current knowledge. Ideally, face-to-face instruction is more effective. However, educators and preceptors find it hard to teach one-on-one because the nurses are tied up with patients, or they are working on different shifts. Another issue affecting peer education is the lack of seasoned nurses to help with educating the newer ones due to high turnover rates in nursing. FL12 is a nurse educator who works alongside frontline nurses, and she describes her challenges in educating the staff nurses.

I think my frustration is, as an educator, sometimes it's just getting through the day without having an incident. There's not really a whole lot of time for education. And I find if we had more staff and I could actually do one-on-one training with people, they would retain it better. But instead, I feel like we get stuck in the email or posting flyers …. And if they're busy, who really has time to sit down and read an email? … I think out of the 114 employees that I have, maybe 10 read their email. So, it's really tough too, as a Monday through Friday, to be here for nights and weekends to get that education piece out. I know some units have nurses that have been there for 20, 30 years. The most that I have a nurse is two years. …, so I don't have the experienced nurses to help me to train the other nurses so I would say that's a huge frustration for me. (12:10)

Ironically, FL16, who was a nursing assistant, actually identified the lack of attention paid to educational posters.

> Because you put up signs all the time. Then, we … as human beings, get used to them, and we just ignore them. (16:12)

FL1 felt that before the implementation of the new electronic medical record system, there was a more consistent practice in fall prevention. Documentation in the new electronic medical record was more cumbersome, resulting in many sections that nurses had to remember to chart. Another factor was the turnover of staff and their learning curve, which caused the inconsistency in practice.

> I think … [electronic medical record system] has changed it a lot. You know trying to change the culture is it's really difficult. So, I think we are doing a decent job prior to [electronic medical record system]. I think [electronic medical record system] … makes it a little bit more difficult to find things. And, …, like the fall risk and the documentation is a little difficult to get to. But I think that we're trying to do that, we have a lot of turnover of staff. So I think to teach the CNA [certified nursing assistant], our patient care techs, to make sure that they're safe and not to leave …, any high fall risk patient on the toilet …, that's the big issue, our ratios are supposed to be five to one, but it's not. (1:2)

Perception of the Frontline Staff on the Outcome of Patient Fall. Is it preventable or not preventable?

This researcher briefly explained to the participants the Decision Tree for Types of Falls, an algorithm created by the Veterans Affairs System to determine whether a fall is preventable or not preventable. Based on their experience and perception of falls, the participants described their definition of preventable versus non-preventable falls. Their description mirrored most of

the principles in the decision tree except they attributed non-compliant patients and accidental trips to the non-preventable category. In their mind, if they have done all they could in providing safety measures, then the fall should be counted as non-preventable.

Preventable

All the participants described preventable falls as those in which safety measures were not being used by the frontline staff to prevent a fall such as the use of a gait belt, wheelchair belt, turning the bed alarm on, staying with the patient in the bathroom, and frequent rounding to assist patients to the bathroom.

FL2 and FL5 were nurses from different hospitals and their perception:

> …, something as simple as a gait belt, because you think, maybe the patient is doing so well, and you forget that they are weak. So those are preventable, even just leaving the bed alarm off, the patient gets up, and then you have no way of knowing this patient is up. So those are preventable falls that are just unnecessary … (2:7)
>
> Well, the preventable one is, … with toileting. If they are a high fall risk, you are to remain with that patient. So, if you don't stay in there with that patient, that patient leans a little bit… because cognitively sometimes people forget what impairment they already have. So, when they think they can still do the same thing as they did before they had a stroke or they have paralysis or something. And then …, that's a preventive fall because you should have remained … with the patient. (5:6)

FL7, a nursing assistant, and her perception:

> …, if you use the gait belt, you're less at risk of having a fall. It is there to catch somebody. Obviously, if somebody falls and you don't have a gait belt on them, then that could have been prevented, and if somebody didn't have the …seatbelt on their

wheelchair and they're leaning over to get something, … that could have been prevented. So, just making sure all the safety measures are taken. (7:5)

FL6, a physical therapist, and her perception:

…, if you're on the fence between using something like technology or a device with someone, and then you choose not to use it, whether it's just for time, or maybe you're choosing not to use it, like the zero-G, for example, for walking, you choose not to use it, cuz' you want to challenge them … that you're putting them on greater risk to fall because you're taking away that safety net, … But, in the same sense, they are not going to go home with that, so, you have to try it eventually versus, let's say, you walk away from your patient to write something down, and you know, they're a high fall risk, and they get up and they buckle, which you should never do. …, so that obviously could be prevented, …, if you're going to walk away, … make sure someone has eyes on your patient, and is within arm's reach, just in case they need some things, so they don't stand up and then fall. … a lot of times, some of the falls that do happen, happen in very difficult times for nursing as well. So like, the middle of the night and everyone has to use the restroom, right? Because they're all on different medications and they have to go now. [laugh] … if anyone's rushing through a transfer, and they don't follow what's on the board, or they make a different decision, or even if the patient gets up on their own, that I think should always try to be avoided. (6:5)

FL9, a rehabilitation assistant, and his perception:

Preventable is something where you didn't have …, the gait belt on and the patient got up and, … without the gait belt on to balance, and you weren't able to guide or stabilize them. (9:6)

FL10, an occupational therapist, and her perspective on using clinical judgment. Other disciplines may not have the same clinical knowledge to cope with the patient's instability:

> A lot of times, it's just a clinical judgment involved. If I see that someone's weak on one side, I'm going to stand on that side, if their leg is weakened and looks like it might buckle, I'm gonna kind of guard that leg more than, … someone else who might not have the same clinical judgment. …, may not pick up on some of those weaknesses. … and therefore, might not respond accordingly. Because it's just a lack of knowledge of that particular condition. (10:8)

Non-Preventable

The participants described non-preventable falls as events which happened when patients are non-compliant with following safety precautions, unanticipated physiologic conditions such as seizure or sudden knee buckling, and the impulsive patient due to neurological impairment. FL17, a nurse, and her description of a non-compliant patient who tried to unhook the wheelchair alarm:

> Some will let it [wheelchair alarm] go off, but then they hook it behind them [wheelchair], so the alarm stopped going. And you are like, "who was that that was alarming?" Well, now, they have hooked it behind them, and they go stand and, they fall right out. So, …, once you know these people can do that you watch more for that. But those that will slide underneath, …, trying to get underneath the belt, so they pull the belt loose. …, I'm afraid the belts are going to get around their neck. … we had one that he kept getting up, turning, he turned on his bed and slid out on his knees. (17:6)

FL12, a nurse, whose perception that falls in the therapy gym was non-preventable:

> The unpreventable, that's kind of hard, because we're teaching our patients to be independent, and then they go to therapy and "Oh, I can walk now," and they really don't have that balance. So it's kind of a catch 22 because you're trying to get them independent, but then when they get to the room, you're like, "Nope, you can't do anything else again." We do have falls in therapy as well, but I feel like those are unpreventable. I think it's just they're trying to see what they can do, and they just get unsteady, or they drop their blood pressure or something like that. (12:4)

FL11, a physical therapist, and his perception that those patients with unanticipated physiological conditions such as buckled knees or patients who were cognitively impaired:

> …something that is nonpreventable would be... it's interesting with the amount of technology we have where we're pushing people, … beyond … their comfort zone, and we're challenging them a lot. And so, …, you've had falls, could be someone is walking, and their knees buckle, then the safest thing to do is to lower them to the floor. … if we're training someone that's just, has a lot more medical issues, and there's cognition involved, or it can be someone impulsive, … and even if you're right there with them, they could make a move, and, it's something that you can't foresee coming. (11:6)

FL24, an occupational therapist, and his perception of those patients with emergent conditions such as orthostatic hypotension and heart attack:

> The non-preventable is, if you're working with somebody and the blood pressure tanks and they fall, there's nothing you can do about it. If they have a cardiac event, you can't help that. Yes, those kinds of things are non-preventable. (24:5).

Patient characteristics.

One interesting aspect brought up by the participants was that preventability of falls depended on patient characteristics. Patients who are admitted to an inpatient rehabilitation setting typically have mobility and cognitive impairments. Due to their cognitive status, some patients may not be cognizant of dangers and perceive that they are capable of performing activities of daily functioning without assistance. There are some patients with strong personalities who refuse help and are non-compliant with instructions provided by the frontline staff. Poor cognitive function can also be caused by taking medications that can cause impairment.

FL22 was a nurse who described patients with mobility impairment after suffering from life-changing diseases such as a stroke or traumatic brain injury. These patients may have a hard time adjusting to their loss of functions.

> Well, we are a physical rehab unit. We categorically get people who … are fallers. …If you ask me when it comes to fall, we get the highest risk population for falls. … We have some strokes; we have polytrauma, we have … spinal injury, that's the most important one. … May or may not be in their right mind because they've had a TBI or something, or a new stroke and might not be aware that their walking status has drastically changed without them knowing. (22:13)

FL13 was a nursing assistant who described impulsive patients and how unpredictable their actions could be, which made it difficult to prevent falls.

> …the patient fall that I've experienced … over the years it's always been that impulsive patient or that patient who they've been doing really good in therapy, and now they feel they can do it about themselves. So I think that the biggest obstacle with that has been,

just the patient thinking they can do something, and like the fall can happen a split second. You can turn around to grab something, and that patient jumps up and then next thing you know they are on the floor. (13:4)

FL21 was a nursing assistant who described non-compliant patients and the difficulties they encountered when patients refused to comply with instructions.

Non-compliant or they just spontaneously get up, or they are real restless, things like that. I mean, say, you are in your room, sit in your chair, I'll walk out, you get up, I run in there, you're standing up and going, "I'm not sitting in that chair. I don't want to sit in the chair". …, nervous energy. (21:4)

FL2 was a nurse who described patients with mobility and cognitive impairments. It was challenging for them to maintain safety for these types of patients.

For me, the most challenging, is their diagnosis, especially their acuity of their sickness, the more acute the patient, the more risk in falling. … the severe their diagnosis, the worse off they will be in terms of safety. (2:8)

Super-ordinate Theme 3: Teamwork - Interdisciplinary Collaboration

Super-ordinate theme three is related to the dynamics of teamwork and how the participants collaborate with their colleagues. A good team consists of a group of capable individuals who are motivated to do their best. They value the contributions of all team members. Individual personalities also influence how the team works and how they share their knowledge (Muhammad, Madiha, & Kanza, 2015). The tenets of success and failure of the team depend on a culture of trust, safety, and inclusion. Leaders who attempt to implement such culture must adjust their behaviors and attitudes to support teamwork (Tyler & Parker, 2011). The participants in this research related the differences in how their teams function within the

same discipline and across disciplines. They value a culture of teamwork in which knowledge sharing creates a learning environment.

Interdisciplinary Collaboration

Good teamwork promotes good camaraderie amongst the team members. FL3 is a physical therapist who worked at all three hospitals and related her experience in interacting with others within her unit and other disciplines.

> … we do work well as a team, …, we have weekly rounds and … we update the team like I was PT [physical therapist], they're transferring into status, and they're walking how far with this much assistance. Whatever the case is, and … we're all in the same area, so, if something does change, or if there is a concern, …, I know where to find the physician and let them know that something happened, …, I know how to contact the nurses. … PT and OT [occupational therapist], share the same space. So we talk pretty quickly. And if sometimes I see the OT that I am working with, if they have a patient that I had earlier, and there was something that I wanted to tell them, I should tell them now. So, I guess, having that open gym space is also really nice too (3:13)

The emerging sub-themes for teamwork can be broken down into teamwork within units and across units. There are barriers and facilitators of both sub-themes.

Teamwork Within Discipline

For the most part, the team works well within the same unit except when there are personality differences and perceived power distances. Ineffective communication can be a barrier if they misunderstand one another. Below are quotes from FL10, an occupational therapist, FL9, a rehab assistant, and FL4, a physical therapist.

FL10, an occupational therapist, explained that teamwork within therapy is good and perceived that it was also good within nursing department.

> I know on the therapy staff itself, it's pretty good within our department. Nursing, … it's pretty good amongst their department. (10:17)

On the other hand, the perspectives of rehab assistant may be different. FL9, a rehab assistant, described how differences in personalities can cause challenges in communication. Some of the rehab assistants may not be comfortable speaking up if the other party was confrontational.

> Challenges are communication; even though we do communicate, sometimes …. can be confrontational from what I've seen. …, of course, every staff members got their own personalities. Some are a little timider than others. … if everyone were more open. (9:17)

Teamwork also depends on familiarity with one another. FL4, a physical therapist, who had only been in the role for less than one year did not know each team member well enough yet to feel comfortable with the person and to establish trust with each other.

> I think it's optimal. I have not been here too long in this current role. So, I don't feel that I've had enough time to buddy buddy with everyone. I think there's a certain line that you cross where you feel very comfortable with someone, and they trust you fully. Prior to that, it's so much more professional, but also, at risk of that bias, or that lack of valuing whoever's opinion. But otherwise, I think everyone works together very well, whether that's setting patients up for lunch, the techs, giving them a hand. (4:12)

Teamwork Across Disciplines

There are differences in opinions amongst the participants on teamwork across different disciplines. Generally, they respect one another and get along well. However, they work in silos, and they do not know each other's role.

FL10 was an occupational therapist who described the differences in opinions and how therapists were being perceived by the nursing staff.

> You try to put the two together; sometimes there's a little friction because you have different opinions, different psychology, different schools of thought, and training. I do feel like sometimes maybe some of the nursing staff feels like we're trying to dictate to them, not wanting to hear philosophy because they feel like they've got a handle on the situation. They don't need to be told how to do something. (10:17)

FL1, a nurse, described the tunnel visions of each discipline and the lack of cross-sharing responsibilities. For example, nurses who are at a higher level of expertise would not chip in to help the nursing assistants. Sometimes it could also be due to personality conflicts.

> …sometimes, we're in our silos, and the tech knows that this is what they're supposed to do, and I'm in my silo, and I've had, other techs come to me and tell me, "Well, at least you help me take my patients to the bathroom, there's this other nurse who says that's not her job", or whatever might be or it might be a personality conflict. So I think that is another issue as well. (1:12)

There are different personalities that work in healthcare. Great teamwork depends on good vibes amongst team members and good communication. FL4 described how conflicts in opinions could result in a reluctance to share ideas, which then lead to patient safety issues.

> So distractions, and …, poor communication ... Oftentimes, they'll be attitudes, depending on the individual, every staff member is different, and certainly I feel attitudes from some that don't seem to care about my opinion in the matter which as voicing an opinion, I feel is important, but you can at times feel that your opinion is not or their

opinion may not be what it should be or holding that …patient safety to the highest standard, … (4:9)

Super-ordinate Theme 4: Communication

Super-ordinate theme four is related to how team members communicate with one another. Interpersonal communication is an important dimension of patient safety. From the previous quotations in super-ordinate theme three on teamwork, it can be inferred from the participants that how well they work together depends on how they interact and communicate with each other. Communication is about individual behavior and organizational behavior. Failures in communication can cause faulty exchanges of information which then leads to ambiguous and unclear information being passed on. Thus, during transitions of care, it is crucial for healthcare providers to communicate effectively to ensure patients receive safe and high-quality care.

Handoff and Transitions

Ineffective communication or lack of communication can be a barrier in ensuring information is handed off to the next provider during care transitions. FL6, a physical therapist, described how time constraints could cause barriers in communication.

> Communication could be a barrier. I feel like, in general, we're very good about it. And more often than not, I'd rather pick the phone up and call the nurse or ask questions, than just go ahead and blindly with something. …just like making sure you take the time to do what you need to do, instead of rushing because time, sometimes is a barrier because you're trying to hurry. (6:7)

Inadequate handoff is another form of communication in which the sender of message did not adequately convey all the critical information to the receiver, and thus resulting in a medical

error or adverse event. FL4, a physical therapist, illustrated a situation in which a poor handoff communication resulted in patient fall.

> … a challenge would be hand off communication between the therapists and potentially an alternate provider, whether that be the nurse with the tech and that's oftentimes where the other provider or myself, because I could be busy, but busy is a word so that we may not be able to provide sufficient time to communicate well, that patient AKA [above knee amputee], that patient needs assistance and you're talking on the phone as I'm doing that, and I don't have time to wait around and have you get off the phone to listen to me and I can verbalize or visually see that you nod your head versus discuss things. There's not necessarily a good SBAR [situation, background, assessment, and recommendation] hand off everywhere, right? And then potentially, you go into a situation where I just fully read the patient was max assist 2 [maximum assistance by two persons] and, you may need the … Hoyer lift, you didn't hear that, or get that from me, and then you're by yourself, and then the patient has a fall. (4:8)

Effective communication. Besides good teamwork, effective interpersonal communication is also key in promoting patient safety as illustrated by FL11, a physical therapist.

> … I think when someone is a big risk of falling, I think the communication with the stars and the doors are helpful. I think the interpersonal communications is good, several nurses that will tell me, "This person's knees buckled last night, I am trying to do a transfer to the toilet", … I guess the best general way I could speak to it is I rarely feel like blindsided. (11:8)

The frontline staff communicates with each other on important factors affecting the patients by using the whiteboards in the patient rooms. FL17, who was a nurse, relied on the therapists to note the patient's status, such as swallowing precautions and level of transfer on the white board.

> We have … those whiteboards in every room. And if I walk in a room, and I've never had this patient before, and they're like, "I hadn't been to the bathroom." I can look up and say, "How do they transfer?" So it says, or they say, "Can I have a drink?", it tells me what their diet is, … if they are nectar thick. How do they drink? How do they transfer? …, so I don't have to run and get a nurse or whatever. It's up to the therapists to keep that board updated. (17:14)

FL24, an occupational therapist, felt that his colleagues consistently use gait belts and passed on notes to one another using the electronic medical record system and the white board.

> …, in therapy, … we are all consistent on using gait belts with folks. The reassessing daily and what they can do, I think communication with the computer is good, because I mean if you look in there and see you can read somebody else's notes, you can look to see what orders are there. So that's a strength because there's no reason you shouldn't know what's going on with somebody. The boards in the room. You may write something on there, that's not patient's, doesn't give their information away. But it's important to that patient or, we write on there, what their level of transfers, what their assist is, those kinds of things. (24:7)

Super-ordinate Theme 5: Staffing

Super-ordinate theme five is related to staffing. Healthcare leaders strive to establish an efficient workforce in the face of a tighter budget in this value-based world (Weiner, 2017). Additionally, there is a mandate from the government and regulatory agencies to provide safer

care to patients. Leaders often struggle to ensure the right staffing levels so that employees can provide holistic care for the patients (Weiner, 2017). The participants in this research felt constrained by the tight staffing level and attributed failures in preventing falls from being overworked and burnout. Barriers in staffing include staffing efficiencies such as staffing by acuity, and the staffing model; sharing the burden of care; the time constraints; unscheduled absences; level of experience; and fatigue. Facilitator include consistent staffing for therapy.

Barriers

***Staffing efficiencies*.** Both nurses and nursing assistants indicate a shortage of staffing or their assignments affect their ability to cope with keeping their patients safe from falls. Nurses' assignments are based on staffing ratio established by their leaders following industry benchmarks. The frontline nursing staff described how inadequate staffing ratio could affect their ability to prevent falls.

Staffing by acuity. The nurses and nursing assistants preferred staffing by acuity to spread out the workload so that a nurse or nursing assistant could adequately spend more time assisting the sicker patients. However, staffing by acuity can have its downside in which their patients may be situated in different corners of the unit, thereby causing them difficulties in reaching to their patients quickly. They also lamented that they did not have enough helpers such as sitters or techs, to assist them.

FL1 was a nurse who described how staffing ratio and acuity of patients affected their ability to get to every patient's needs.

> Yes, … it's just staffing ratios. And our patient acuity is just so high, especially if I'm a night shift nurse, and I have to take care of 10 patients, and then our techs have more than that, …, somebody is on the commode, and three other bells are ringing … it's difficult to

make sure that somebody is not getting out by themselves, especially those impulsive CVA patients or brain injury patients. (1:3)

FL7 was a nursing assistant who would like to see a fair distribution of patients based on fall risk level and acuity.

…, it's better when you have fewer patients that are a high fall risk. Some of them have restraints; you are taking the time to undo the restraints just to get them to where they need to be. And then any high fall risk patients, you can't leave them in the bathroom to go do something else. In the meantime, you always have to be right there with them. So, it's better or if it's broken up a little bit. (7:8)

FL5, a nurse, felt that patient safety should be taken into consideration when determining staffing ratio.

I think we have to look at, … with our management people, they again, get a report on all of the patients every day. So I think we have to look at when we're doing an assignment that we're not having too many high fall risk in one person in the assignment. So, we have to look at it and try to kind of balance a little bit and that way your staff can manage the care and prevent falls for the patient. (5:30)

Nursing model. Also, the nursing model in a rehabilitation unit can affect efficiency and patient safety. Unlike other hospital nursing units in which patients are mostly confined in the patient rooms, rehabilitation patients spend at least three hours per day in the gym with the therapists. Rehabilitation patients have a longer length of stay in the hospital as compared to acute care patients. Thus, nurses in rehabilitation unit work very closely with therapists, physicians, case managers, and other disciplines in providing holistic, interdisciplinary care.

There are two different types of model of nursing, namely primary and team nursing (Wobbe, 1978). Wobbe (1978) distinguished the two models of care based on the delineation of the authority of the nurse. Primary nursing decreases fragmentation of nursing services by holding the primary nurse accountable and responsible for the patient's care. Team nursing decentralizes authority and promotes the development of each team member. The nurse works together with other nurses or nursing assistants in a team to deliver comprehensive and efficient patient care to a group of patients (Wobbe, 1978). FL1, a nurse, described the advantage of primary nursing:

> I came from where we were doing primary care nursing and …, you always had these nurses, these patients, and that's nice because you get to know what they can and cannot do and that's really helpful when you're here for so long because now, I only work one day a week, I don't know them as well and what they can and cannot do. And sometimes our patients are manipulative enough, they're like, "Oh, this is a new one, let me see what I can get away with" … the experience level of the nurses can affect me versus seasoned and non-seasoned nurse can affect the score. Just like I'm working with this patient all the time, I've worked with them for the last 14 days, I know what they can and cannot do as opposed to I've never met this person my entire life, I don't know how they can transfer. Night shift says they transfer minimum [minimum assistance] and they're really tired at night, and they didn't sleep well, and now they're transferring as a max [maximum assistance]. (1:28)

Below is a perspective from an occupational therapist on the nursing model and how it affects the interdisciplinary team and patient safety. With the current structure of team nursing, she felt

that the nurses did not know their patients well because they had different patient assignments each day.

> I think it helps too when you have a consistent caseload. For therapy, we kind of have the same people every day. So, we know how they move. We know what their limitations are. Nursing, if they're shifting to different rooms or clusters of rooms you don't really get a chance to learn your group of people so well. And I think things move a little more smoothly when you're familiar with who you're working with. So, keeping that as much consistency as possible. (10:25)

Sharing the burden of care. If the current staffing ratio were to be maintained, the nurses suggested adding ancillary staff such as a sitter and sharing the burden of care with other disciplines. FL1, a nurse, would appreciate greater collaboration from other disciplines in keeping patients safe.

> So, if I had somebody …, who came through and turned everybody that was an extra pair of eyes at somebody … if therapy would be sharing patients and getting them up in the morning. If they were doing more of that, that would be extra help. So, it's not just all in the nurses' job to get them up in the morning. But also putting them to bed and then let you know, that would be a nice extra hand there. (1:15)

Time constraints. Rehabilitation nurses had to juggle multiple priorities and follow set schedules for patients such as meal times and therapy treatment time. When they were in a hurry, they were unable to spend more time supervising the patients to perform activities of daily living, which contradicted the philosophy of rehabilitation. FL1, a nurse, described situations in which they were under time constraints.

I think trying to get everybody in, in the cafeteria of the gym for breakfast at exactly eight o'clock in the morning is really difficult. And so, your night shift is usually understaffed and overworked, trying to get half those patients and then the new staff, … somebody might be running late. So just trying to get all 40 patients into the gym to eat is really difficult. And it might be that we have an issue, so everybody's running around, and not really focused on, …, they're doing things quickly. …, the goal of rehab is to make the patient do the work. And …, we got to get all of my patients up and in the gym. So I think that's frustrating, as well as, like a set schedule, …it's on my task list, I gotta get my patients in the gym by eight o'clock. So they can eat and have their therapy start at 8:30 a.m. or 9:00 a.m. And, you gotta hurry up and eat, or you gotta hurry up and get dressed ..., the not taking the time and the patience with it. And like I said, having not enough staff to be able to get them safely over there. (1:8)

***Unscheduled absences*.** Unscheduled absences such as unexpected sickness or circumstance, causing a staff member not to be able to work the scheduled shift can affect both nursing and therapy due to the lack of scheduled manpower. Those who were working would have to absorb additional workload or prioritize their workload to focus on critical issues at hand. In a bigger hospital or unit where there are more resources, it may not be as constrained as a smaller hospital or unit in which there is a lack of personnel to distribute the workload. The quotations below from FL10, an occupational therapist, and FL11, a physical therapist, described the challenges that they face.

But sometimes, … everybody tends to call it one time and call out at the same time. And, …, you run out of manpower. Yeah, if you have all your call lights going off. (10:10)

> ... you have 40 beds, and one person's out sick, you have more people that can help take the load, and there [at a smaller hospital], they have, if one person's out, their caseload goes from five, or six to seven. … There are like split therapists, and they are there to help offload it. … when someone is out sick there, they have to do a lot of doubling. …, they have to see two patients at once, …, a lot of times the things that could cause falls, you don't always do them because you're treating two people … you used to have less hands or less time to set someone up on something that could be a little more, challenge a patient more that could lead to falls, … bring them in the position of walking; maybe it is harder to do if you're treating two at the same time. And so, and maybe a different way that may actually decrease falls in some ways because you're trying fewer things. (11:2)

Level of experience. Healthcare is a service industry and highly dependent on the expertise of the healthcare professional. Consistency in practice depends not only homogenous training but also the level of experience each personnel has with the patients. Patient care is highly variable, and it takes an experienced healthcare professional to assert their skills in coping with different types of patients. When onboarding new employees, they have to learn the practices of the organization and adapt to the culture of the team. One of the barriers described by the participants was lack of experience in the new staff due to insufficient focus on falls during orientation. There are also critiques of current workflows which are too task-oriented and not promoting good critical thinking skills.

FL3 was a physical therapist who graduated one year ago and had been working with the organization for less than one year. She described how she was taught during orientation.

> I believe I was taught the same way. I know during the orientation period, you obviously train with another PT [physical therapist] or whatever discipline you are in. And so, you

kind of see how they do it. But for example, if I was with one PT, and they do it a certain way that they may or may not have been taught that, I don't know if that's what is being taught but they only been around that one PT, for example. … as you get into the workflow, you can see other people are doing very similar things. And I think it is hard to say, because I don't specifically remember during orientation how much we talked about, like a specific procedure of …. put the belt on, make sure you are standing here and here, because I think a lot of us received that training in school, or whatever discipline we were. So, I don't think they necessarily focused on that during orientation. (3:3)

FL8 was a seasoned nursing assistant, and she described the inconsistency in precepting new employees which could lead to inefficiencies.

> And then new people come in, and they end up letting them precept with what's definitely a problem person or somebody that hadn't been here that long and they're just all picking up bad ways and then we got to deal with it. (8:21)

Self-learning using the media was another way to educate the employees. FL4 was a physical therapist who described how he learned about the fall prevention protocol through an online learning system called Healthstream. He also learned from his peers and through observations.

> …, with the Healthstreams, the online educational service, …you learn about the fall risk signs and bracelets and things. Beyond that, you know, as a therapist, I kind of assume every one of my patients is going to be a fall risk. … I don't think that's necessarily something that's location specific, whether that's here, or my work with [another organization], and learning what also consists of on the job of policies and procedures … if this was to happen, you do this, if this adverse event occurs, you do this. Fairly informal at that point. But, do I feel prepared as to what to do after an event? Yes, and

also again that's where the experience comes in from having had a patient fall and what I had to do after that. (4:3)

FL18 was a seasoned physical therapist who described how the amount of experience working with the patient could affect the risk of patient fall.

Some of it is just the continuity of the staff working with them. So whenever you have an unfamiliar patient on the staff caseload, like, I feel like the chance of falling is higher, just because they don't know like, little things that make them tick. (18:5)

Although there is expertise within the same organization, it is often difficult to pass on the knowledge to the less experienced staff due to their lack of motivation to seek out more resources. FL12, a nurse educator, described how the younger nurses were reluctant to reach out to others with more expertise and to find their resources.

… a lot of our barriers here is with nurses that have only been here for like two years. It's hard to get them to branch out and find their resources. I think they tend to stick more to nursing because that's who they know is nursing. But if they would just kind of tap into their resources, there's so much out there that these therapists can help us with, …we have one that's our fall champion, and she does all the lifts and education with lifts, just go in to her and saying, "Hey, I have a patient that I feel we could do this, this and this", and she is a wealth of knowledge. I think they get more focused on the task. Oh, I've got to pass meds, I've got to chart, I've got to do this". And when they have downtime, they don't think of that as an opportunity to go and see what they can do differently. So I think that's probably the biggest barrier. … And usually, that happens about three to five years, and they just aren't at that phase yet. … just getting through a day for them is what they need. (12:18)

***Fatigue*.** Another barrier for the staff is fatigue due to long shifts. Fatigue can also affect cognizant issues and ability to focus and may have an impact on patient safety.

> Yeah, I mean, tired. They've been working long shifts, …maybe 12-hour shifts, at towards the end of that shift, you probably going to be a little more fatigued and maybe not be as cognizant, or, too focused on those sort of things as fatigue sets in. If you don't have the right personality for the job, and it's not important to you personally, or, if … feel like one of these overconfident folks who aren't willing to take direction or input from others that could have an impact. (10:15)

When frontline staff felt overwhelmed or burned out, it could compromise patient care. FL23, a nurse, described how some nursing assistants may not seek help thinking they were responsible for responding to the calls from multiple patients but yet could not cope with the situation.

> And it's hard sometimes. Even I know that it's hard sometimes because you've got somebody else's calling, or two people might have to go at the same time, especially for the care partners. But a lot of times, communication with care partners is one of them may call me and say, "Hey, these two people have to go, I'll take one, you take the other," so that works out. But sometimes someone feels overwhelmed, or if they feel like they can't speak to the nurse, or if they feel they might just try to do both things? So, that just kind of goes back to communication and things like that. And everybody is feeling like we're working together. We're a team for us to be able to accomplish little small things like that…umph….[sigh] (23:4)

Consistent staffing. Therapy staff did not have as many issues with staffing levels. FL18, who was a physical therapist appreciated that her leader provided consistent staffing and patient assignments.

> … one thing for the continuity piece, you could always have, consistent staff that always work with those patients. So I've been in facilities where staff is assigned to room numbers. And, unless those rooms are empty, there is no shuffling, …, you're always in charge of rooms one through five or whatever. So then those day and night shift staff consistently know that patient. So there's better continuity. They know the little ticks and things that might make that patient be at a higher fall risk so they can help prevent them and know about them. (18:9)

Super-ordinate Theme 6: Leadership Support

Super-ordinate theme six relates to how the leaders support the staff in their efforts to keep patients safe. Leadership plays a role in integrating care amongst the different disciplines. They set the culture by developing and disseminating best practices for delivering safe, effective, and efficient care to patients. The participants provided their opinions on their leaders during the interviews, and their thoughts were captured in super-ordinate theme six. This super-ordinate theme offers the answers to Specific Aim 4: To explore the definition of a patient safety culture through the lens of frontline staff.

In general, the participants were appreciative of their leaders' efforts in promoting patient safety. They felt supported by their leaders and trusted them by not micro-managing or hovering over them. Most of the participants viewed the nursing or clinical coordinator as a leader of their unit because at least one coordinator was always on the unit working alongside them and could help resolve problems. They viewed their managers as formal leaders whom they would approach when they came across systems or organizational issues. The participants appreciated leaders who have an open door policy and who readily jumped in to assist when needed. Some viewed the physician as a leader or an authority figure. Their morale goes up when the

physicians recognize their work and express their gratitude. Another morale booster is the celebration of successes, such as having no patient falls for a specified period.

On the other hand, some participants felt their leaders were not holding all the staff accountable, which then caused bad habits to persist. When bad habits were not addressed, others who were doing a good job felt demotivated. Some stated pressure by their leaders to complete their work on time due to budget constraints compromised safety as they had to rush and leave patient unattended.

Barriers

Accountability. Some participants felt their leaders were not holding all the staff accountable, which then caused bad habits to persist. When leaders did not address bad habits, others who were doing a good job felt demotivated.

Adherence to the fall prevention policy requires holding the frontline staff accountable for applying safety measures to prevent falls. If there is a lack of accountability by their leaders, the frontline staff may not understand the importance of adhering to the protocol. The quotation below from FL18, a physical therapist, who would like to see her leaders address the employees who are not adhering to the policy so that the mistake will not be repeated.

> I feel like the policy itself was good. I think some of the adherence to the policy could be worked on. Like, if there was just better ways of making sure people do it, if there was some kind of …., I won't say punishment, but like a repercussion, if you weren't following it. Whereas sometimes it feels like people don't follow it, nothing's ever said about it. So it's never taken care of. So the behavior just continues. (18:10)

FL5, a nurse, described the consequences of not following policy.

…, and I think education ongoing is a big part too, to let them know, what are the other consequences of immobility, or incontinence. So those things need to be addressed. I think it needs to be at the forefront. And I think we have to hold people accountable. (5:15)

When counseling or correcting staff, FL1, a nurse, preferred her leaders to approach the frontline staff on a one-on-one basis to educate the person rather than a mass email message to all of the staff.

… they've tried to really help implement protocols and procedures that make patient safety a priority… I think there's always room for improvement, … we get a ton of emails, "Man, y'all forgot to do this, or you need to do this." And I think sometimes people take it offensively when one thing happened with my patient; everybody gets an email. And the thought is, …, instead of coming to the person and saying, you did this particularly wrong, let me educate you. They educate everybody. So then everybody assumes they're the ones that are doing something wrong. And it might not necessarily be if they're doing something wrong. But I understand that there is though, like that way. (1:21)

Budget constraint. Leaders were under pressure to manage their budget and improve productivity. Some stated pressure by their leaders to complete their work on time due to budget constraints compromised safety as they had to rush and leave patient unattended. FL5, a nurse, understood that her manager was holding everybody accountable but felt that she was being rushed to complete her tasks so that she would not incur overtime.

Everybody is accountable. And it's not like you, … have to rush because in the back of my mind, like I'm eight hours and I'm gonna be honest, I feel like I'm rushed to do this,

I'm rushed to do that. But I got to think about the welfare of the other patient, even though, I may get what I call "chastised" or, whatever, for leaving late, I'm fulfilling the needs of my patient. (5:32)

Equipment. Every patient in a rehabilitation unit uses a wheelchair due to mobility impairments. The rehab staff also uses equipment such as patient lifts to transfer patients if they need more assistance. The gym has many equipments used by physical therapists and occupational therapists to treat patient. There are some device, such as gait belts, wheelchair alarms, and self-release belts that are used to prevent the patient from falling. When the equipment is broken or misplaced, the frontline staff would have to spend time looking for them or not use it at all. Delay in getting an equipment or not using the equipment can then lead to patient falls and staff injury for not using appropriate equipment.

FL6, a physical therapist, described the inconsistencies in storing equipment which caused wasted time in locating the equipment. Sometimes they have to share one piece of equipment, which makes it hard to prioritize which patient should go first.

We actually have quite a lot of equipment. We don't see as many patients that require, I feel, the dependent for Hoyer lifts as some other places I've been on, like, for school and things like that. …, perhaps, if we had more of a patient population that "Okay, I know, this has happened before, where we have one patient on each, like team hall, and they each need the Hoyer lift." And, it's just like, "Okay, well, you gotta wait for a second, because, you know, Mr. Jones, and, like, on this side needs it and that Mr. Smith needs it over here right now." So, but I'm not sure where we will put it. …, we have nowhere to put it …[laugh] (6:8)

Even though there is enough equipment, FL9, a rehabilitation assistant, would like the broken equipment to be fixed quickly.

> …when we do have equipment that is out of order that we get someone to fix it more quickly. (9:14)

Likewise, FL17, who was a nurse, had to take the time to troubleshoot when some functions of the equipment were not working as they ought to be.

> … when I hear the bed is not working, or they told me this morning, one bed, the lights weren't working. So, the alarms were working, but … they go in there; there would be no light on. So, they would keep trying to set the alarm, and …, the alarm works but no the light. So, the guy came in today too, … (17:16)

Consistency in the placement of devices and equipment will increase efficiencies. FL10, an occupational therapist, understood the importance and took her initiative to place them in strategic locations to facilitate faster retrieval.

> …, I guess sometimes environmental things like if you can't find the gait belt, like if there's not a consistent place for that to be kept. So it could be over here in one room and another spot in another room, you have to take the time to look for those things or they don't have the socks readily available to put on. Yeah, you know, it's easy just to go I will forget it, I can't find it. I'll just move on and get it done quickly. Maybe if there was a more standardized way of placing things, locating things, so that it is easy and quick and visually, kind of in your face. … if I take someone's gait belt off after I put them in bed for rest, I make sure to put that gait belt in the seat of their wheelchair so that if the next person comes around to transfer them, if they're going to put them in the wheelchair, they

are either sitting on the gait belt, or they're going to pick it up and put it on the patient. (10:11)

Inconsistency in the storage of equipment can cause confusion and inefficiencies in workflow. The quotation below is from FL14, who was a physical therapist.

… sometimes we have a hard time finding the right commode seats to put in the room, and so, …, it's wasteful time, not necessarily. Sometimes it is stored, but things kept being moved around, I don't know. (14:7)

Physical space. Space constraints could hamper the ability of the frontline staff to maneuver the patients. Rehab patients normally use an assistive device such as wheelchair, walker, and crutches, to assist with mobility. The room may be cluttered with many types of equipment. Similarly, the hallways could also be cluttered with equipment such as lift devices. Space constraints can cause it hard to maneuver patients. Below are some quotations to illustrate the challenges that the frontline staff was facing with physical space.

FL15, a rehab assistant, described how the design of the rooms could cause difficulties in maneuvering patients.

…, some rooms are kind of set up in a way where … there's like, a table or something that's in the way and, and then I feel like … in an awkward position, trying to get them back into bed. (15:7)

Similarly, FL17, a nurse, was also having difficulties trying to work with the patient in a crowded room in which it was too small to fit all the essential equipment such as wheelchair and patient lift.

It is crowded. So, you've got the computers, but the nurses that are going to try to give med, and you've got their wheelchairs that didn't fit in the room, because they've got two

patients in that room. And don't have room for two wheelchairs and their family. And so it's more crowded, …the barriers are, the rooms are too small. (17:11)

FL18, a physical therapist, stated some of the staff decided to forgo using a patient lift to transfer the patient due to space constraints. The consequence of not using a patient lift to transfer the patient could lead to a patient fall or back injury for the frontline staff.

> Sometimes with the rooms being so small. I feel like if Hoyer lift is recommended, sometimes, people don't feel they can get the lift in there to do what's needed. So, they have to make do without it. (18:6)

Another barrier due to physical space is based on the geographic design of the unit. Staffing assignment can affect how much distance a frontline staff has to make from one patient to another. FL13, a nursing assistant, described the configuration of the nursing unit and how inefficient the workflow could be if they were assigned patients in two different hallways.

> Well, … our unit is set up basically like an L-type shape. So, what we have called the short hall, it has fewer patients in that hall than the other. So if there's only two of you, whoever has that short hall, the other half of their patients can be on that other hallway as well. So, that put some distance in between where your group is and where the one side of the group is, and the other part of your group is. (13:8)

Process Design. Inefficient operational designs can result in organizational barriers for the frontline staff. Leaders are responsible for designing processes and providing tools that facilitate efficient practices. Inconsistencies in practice and ineffective communication can lead to errors. Effective communication from one team member to the other requires a standardized handoff communication tool. If there is an inadequate handoff, it can lead to compromised care for the patients. It is also important to have good team dynamics as conflicts can arise due to

differences in opinions and different personalities. When things go wrong, team members look up to their leaders for holding staff accountable and promoting a fair and just culture.

The inconsistent practice of fall prevention by the frontline staff can result in gaps in care. As alluded earlier in the chapter regarding fall prevention protocol, there was a discrepancy in risk assessment between nursing and therapy. The risk assessment is very subjective, and the frontline staff may use their judgment on what they think is best for the patient. This results in inconsistent application of fall prevention measures. This type of discrepancy is best illustrated by the quotation of FL22, who was a nurse, describing his rationale on when to turn on the bed alarm.

> …. every nurse is different. Some nurses are very good about the bed alarms; others are more, … like me. It's more of a spot check, "Oh, I have a suspicion. I'm going to check this one patient and see if they're on a bed alarm." And then put them on a bed alarm. Some of it is the time of day. Bed alarms, don't do a lot of good if the patients are getting up and down, and stay off the bed alarm, …? They're getting up for therapy, going back down to rest between therapies. Now, they have to go to the bathroom. They get out there; they are busy during the day. you have to be scrupulous to … not just turn on the bed alarm but when they turn off bed alarm, have it in … a setting where it will be on standby. And then when the patient gets back in the bed, the bed alarm will reactivate without you having to do it automatically. So it's kind of frustrating. I mean I've had falls on my watch. (22:8)

The interdisciplinary team interacts more closely with one another during the day shift. Nurses and nursing assistants are the only ones working during the night shift, and they rarely have the opportunity to interact with the other disciplines. Night shift nurses may not read the

recommended strategies by therapy staff. From a physical therapist's perspective, night shift nurses need more cross-training with therapy.

> …, I've tried to put on the board too if it helps back patients, hip patients, knees patients, they should all use the walkers when they're transferring, rather than using the grab bars. Grab bars are there, it's quicker and easier to get the wheelchair in there and just have a pull up on the bar. But that's not always the safest method. So when I specifically want the walker and trying to put that up there, I don't know if they're not necessarily always using a walker, maybe some of the recommended strategies that maybe we need to …, look at that. Maybe a little more education on the evening shift, they don't see the therapy team as much. So maybe we need to do a little more cross-training for those folks to get them to understand why we're putting certain things down. (14:13)

Facilitators

Supportive and trust. FL13 was a nursing assistant who described her manager as having an open-door policy which was always ready to address any issues that might crop up. They also looked up to their nurse clinician whom they solicit advice and help on the unit.

> I feel like our nurse manager has always had an open-door policy. …, our nurse educator, she's our nurse clinician, her doors are always open. Our clinical coordinators, like charge nurses, all of them have always been really open to when we need to communicate with them. So I think …they're visible. So someone's always around. (13:15)

FL3 was a physical therapist who described the support she received from her leader who was not always physically present on-site but would help resolve the issues she brought up.

> … especially from PT [physical therapist], …, our manager is not always on-site. But I know that she is usually very quickly available. So, if I had a concern, she would be able

to email me back with whatever I needed, but I think, that they also do a good job of if there is an issue that arises. So, we have meetings once every two weeks for the whole PT [physical therapist] staff and the OT [occupational therapist] staff, also the speech therapy staff. So, I think that during those meetings, they do a really good job of, …, "These issues have been brought to our attention since our last meeting, and here's how we are going to address that", or, "here's a resource that you can use to try to fix it" And so, I think … considering that you can't always be there at the same time as your manager, they do a good job of addressing concerns that are brought to their attention in a timely manner. And, …, if there's something that needs to be addressed before one of those meetings, they send out an email to say, "This happened, and someone brought this to my attention, and I wanted you guys to know how I responded, and, here's the email", …, so that we're all on the same page. And so I think very transparent communication is how they primarily help us. (3:17)

FL18, physical therapist, appreciated being given the autonomy to do their job and complimented her manager. However, she was not sure which nursing leader to go to when she needed to report a problem.

…, as our PT [physical therapy] manager, does an excellent job of that. I can never find anything to suggest for her to do better because I feel like she's very on top of things, but then not hovering necessarily. She gives us some autonomy. But she's there if we need her, and you don't see her on the floor every day. But it's, I can get in touch with her if I need to every day. And she is on the floor most days for some time. Sometimes it feels like nursing; it's like if I need to report a problem. I don't necessarily know who to go to.

So I think if there was a clear, like hierarchy or structure there, or just even just a point person that might be helpful. (18:14)

But again, it's, I'm not super sure how they're structured. So it's like, I know, they have a nursing educator, who is often someone that will go to if there's a concern, and then there's a charge nurse, and then the nursing supervisor, but then she's not necessarily always on the floor either. (18:15)

Recognition. FL2 was a nurse who related how compliments from leaders and physician gave them a boost of morale.

And you just see them, and you can tell them anything anywhere, they are available, they're more available probably than any of the hospitals that I have worked. So patients see them, and they just know that "Oh, the doctor will be here tomorrow, they will take care of that." They are more accountable. And they are more approachable, which is a good thing. So it's just like keeping it to that way, it is working. And if we can do something more, it is more welcome. Just keep that cohesiveness, openness. And just sometimes, it is like commending other people, there was a time that some doctors would join in and put in notes about what they noted about certain staff members. That was impressive. I know we are all together, but when you say it, it is more real. (2:31)

Non-punitive environment. The non-punitive environment encourages staff to share and educate each other, as described by FL23, who was a nurse.

…, things are very nonpunitive when they happen. …, you're encouraged to share and educate and, tell each other, we're encouraged to learn from our mistakes. (23:11)

Personal accountability. Good employees hold themselves accountable, and they lead by example. They educate and encourage each other to do the right thing and make good choices. FL6, a physical therapist, described how she held herself accountable for patient safety.

> I think like double-checking is always a good thing. So if you have a patient, they're fall risk, they don't have a band, just be aware, and take the time to go grab one or to tell the nurse that they need one, if they don't have a chair alarm, or if someone's impulsive, and they don't have a blue belt, initiate the conversation saying, "Do you think we should do this too?" So, that way, those right things can happen. And then, educating the patient as well. And so I try at least the first several sessions to be like, …, "Mrs. Jones, I'm putting you back in your room. Do you think you're okay to get up by yourself?" And if they say, "Yes," then you know, it, … raises red flags, and making sure that you go over with them because it's a new place. "You know, you wake up in the middle of the night, and you think you're in your room, and you're not, you're in the hospital, it's going to be disorienting," so just make sure that they're aware too. (6:10)

Adequate equipment. The participants appreciate their leaders in providing them with adequate equipment to do their job. FL23, a nurse, felt blessed to be provided with adequate equipment.

> We are very blessed here because we have a lot of equipment compared to, you know, other organization I've worked for. (23:10)

According to FL9, a rehab assistant, the equipment is easy to find.

> Yes, I feel like the equipment is easy to find and everyone knows that it's all the way down the hallway, with the lift equipment. And then we do a good job of making sure patient that are more impulsive are closer to the nurse's station, which is excellent. (9:10)

Super-ordinate Theme 7: Ideas on Strengthening Interdisciplinary Effort to Promote Patient Safety

In super-ordinate theme seven, there are five themes of suggestions from the frontline staff on how to further strengthen teamwork, promote interdisciplinary interaction, and integrate patient safety into their workplace. Their ideas answer Specific Aim 5: To recognize the recommendations from frontline staff on how an organization can successfully integrate patient safety culture into their workplace. The five themes focus on communication, process, education, interdisciplinary collaboration, and leadership.

Communication

The participants suggested improving cross-discipline communication. Communication is the key to improving patient safety. FL4, who was a physical therapist, emphasized the importance of one-on-one hand-offs from the nurse to the therapist and vice versa so that they could provide undivided attention to each other.

> So, I think there could be a greater emphasis again, on communication, and communication that is does not have a caveat of distraction, a better hand off. Again, for example, the nurses tend to have a handoff, one on one, minimize distractions, it may be in the patient room; there's a policy to it and a procedure. Oftentimes, as the therapists are, as far as I'm aware, [hospital] has no procedure for therapists to receive hand-off or vice versa. And that's where the communication style and differences and opinions and attitudes and fatigue of the day could potentially cause an event. That's, not optimal. (4:17)

Similarly, FL11, who was a physical therapist, acknowledged that therapists had opportunities in relaying more specific information to the nurses so that they were aware of the patient's functional capabilities.

> I think the other thing is on our side with therapy; I don't think we're always good at communicating. So, when we do balance assessments, we look at a lot of different things. …, there are lots of standardized measures we use, and I think we could probably do a little bit better job communicating, like what we found to nursing as far as, …, when they turn to the right, they lose their balance, when they turn into the left, they don't, when they look up, they get really dizzy. (11:10)

FL23 was a nurse who felt that there could be better communication if the team member did not feel excluded. She perceived the reason for the lack of inclusivity was due to the inconsistent presence of nurses in interdisciplinary team meetings. Nurses' schedules were not in sync with therapists and physicians, and they often had to attend to patients' medical needs when the patients were off therapy sessions.

> Better communication, because we do communicate but better communication. I know, we do rounds a few times a week on certain patients. And, when we go in, it's kind of, I don't know, for other people, but I know for me, sometimes at rounds, I am just like standing there wait, if they look at me and want me to talk, I'll say something, you know? You need, it doesn't feel, I don't always feel as included as a group with them. Um, but I think that's the idea is to include us and then we're busy a lot, and we can't always get in there at that time either. (23:22)

Process

The participants verbalized the lack of consistent process to hold one another accountable. For example, FL14, who was a nursing tech, suggested having scheduled bathroom time to decrease a patient's urgency to use the bathroom. Another suggestion was to designate one staff member to do toileting rounds and help patients to the bathroom. From their observations, most rehab patients fell due to the urgency to use the bathroom and the lack of assistance in toileting.

> I think some of the patients would do better if they actually had a scheduled bathroom. And I know we've done that sometimes in the past, it's stressful to keep up with, as a staff. But I think that when we implement that. … we can't do it for everybody; you know what I mean? It would be impossible. But I do think that getting to them more quickly when they call to use the bathroom is kind of a good prevention, I've considered it at times how can we help them better with that, because that's what I hear them, "Nobody comes, they don't come when I call, and it takes too long. And I know how I am, I am impatient. And once I decided to do it myself". And I think that's what these folks feel. And then they get anxious about five minutes might feel like half an hour. Some of them say it takes time to get there. But I almost wonder if we had certain techs that were assigned just for toileting and making rounds for toileting. (14:6)

Much like FL14, FL22, who was a nurse, suggested having a dedicated person to perform double checks on safety measures that have a high frequency of human errors, which could be effective in averting a safety event.

> If the [coordinator], or the charge nurse could do something like check to make sure that people armed the bed alarms. The check has to be done at the right time of day; if it's

done at 8 a.m. when patients are getting up, it doesn't matter. If it is done, however, at 3 p.m. after therapy is finished, that would be an effective time to check to see the bed alarms are on. (22:18)

Another process that has a lot of variabilities is documentation. FL6, who was an occupational therapist, suggested communication via good documentation would help improve collaboration amongst different disciplines and different shifts. Pre-electronic medical record system (EMR), they used a paper log to communicate with one another. With the new EMR, there was a message center for them to review what's going on with the patient.

…, documenting, and, even over documenting when something happens, and making it very clear. So, for example, with therapy, we try to put things in our precautions. So, like, if someone has like seizures, or if they're on a high fall risk that has to go in their precautions and we make it kind of blatantly clear, that way, you can't miss it. … They are just now coming here. So, if someone does catch something that could make them a higher fall risk, make sure that you include that. …, I know in [electronic medical record system] there is one way that we can send communication, because we used to do the blue sheets, and the blue sheets in the patient care binders were very helpful, because you could look and see, "Oh, the Night Nurse, like they got up, and they fell", with the nurse, and they put something on the blue sheet. Yeah, we don't have the hard copy anymore. So, I'm still trying to find, …, there's a messaging system that you can double check. And it's like an interdisciplinary note, and just like at the beginning of the day, just check and make sure ... (6:16)

FL16, who was a nurse, was optimistic that if everyone followed the policies and looked out for patient safety, the team could successfully prevent falls.

I just think that people just need to work with getting better at the policies. Because there was for a while, we had a long stretch of no falls. So, if we can go back to the no falls, that's nice, because we can do it [feeling excited]. (16:14)

Education

The participants believed cross-discipline education would enhance collaboration for patient safety. They suggested cross-training between therapists and nursing and especially the night shift nursing staff who did not get to interact as much with therapists. FL18, a physical therapist, suggested a better understanding of each other's profession and expertise.

Maybe better understanding each other's roles? Because I know, sometimes there's a little bit of a crossover of our roles, and then there's the people who are, "Oh, that's not my responsibility." Like, I had a circumstance today that I had a nurse come up to me and asked if I was doing something with a patient, and I said, "Yes." And she said," I thought you weren't allowed to do that with the patient?" And I was like, "Oh, no, we definitely are." You know someone else had told her that we couldn't. I don't know what the context was. But it was just kind of that there is we don't all know everything that each one does. And we've talked in the past about doing like shadowing. So, like having a PT [physical therapist] shadow a nurse for half a day, and vice versa, so that we can really understand their role. But I don't think it's really a common thing yet. (18:17)

FL14, physical therapist, believed new employees would understand the importance of fall prevention if there was more focus on educating them on fall protocol during orientation.

So we do orient role, we have the nurse, … or new nursing staff, come and shadow therapy. They are with us for maybe about an hour, but it's during when we're doing patient care, so they get to hang out with us for only an hour, see, maybe one or two

> things that might be applicable to them. But we really don't have the time to really offer them training. And I feel like it would be really helpful to do more training with the nursing staff to be able to cross-train why it's important to do things a certain way, and why we're asking things of them. Or, recommending things I guess I should say. (14:20)

Variation in practice is not due to the fall protocol but rather the experience of the frontline staff. For example, a seasoned nurse has it ingrained in them, whereas a new nurse may have a learning curve as they do not get much education during orientation. The participants preferred in-person education rather than online learning. They appreciated reminder via face-to-face by leaders. Below are some excerpts of their opinion from FL2, a nurse, FL20, an occupational therapist, and FL16, a nursing assistant:

> The protocol itself is good. What I have seen also, is like, lacking because I don't want to be biased, in between the ones who have been here, seasoned nurses and techs. But, I do a lot of precepting with nurses, but I'm not sure if the techs sometimes they get enough time to ingrain in their practice, like the routine. Because sometimes when we have new tech, …, it is scary when you watch them; the safety is not there yet. So I would think maybe to focus some days of orientation to just focus on falls and what we do. To just, kind of really leave it open up, go step by step, and just try to explain to the techs or the nurses. I don't see so much with the nurses, but with the techs because they are the first one to get there before the nurses. I would like to put some more focus on fall prevention in their orientation than what they have now. It seems like it is too late for them to catch the concept of how safety is important for the patients and us. (2:15)

> The only thing I can think of is, you know, annual reviews, maybe not just a video or something to watch about safety or whatever, but actual, you know, reviewing practice, face-to-face. (20:11)
>
> Or even, even if the nursing coordinator or someone just, is delegated to just say, "Hey, everyone, gait belts, fall risk," and actually make sure that they have their alarms on. (16:13)

Besides educating the staff, FL11, a physical therapist, suggested educating and involving the patient's family in fall prevention. Family members who are visiting with patients can be a second set of eyes to assist the patient. More collaboration with patient's family will also help prevent falls.

> One thing is, I think, allowing family when they are there to actually put their hands on the patients. And so yes, I know that we're working on doing like early family training. But I think a lot of times the family is there. And sometimes, because of time constraints and caseload, nursing can't always be there. …, whether it's nursing or therapy, actually doing some training with the family early on, that might actually be a good thing as far as fall prevention because the family can actually put their hands on them and do it. (11:10)

Interdisciplinary collaboration

FL10, an occupational therapist, suggested making friends with the other disciplines first so that they know each other socially and will be more accepting of each other's expertise. Leaders of the organization may organize social events to bring the different disciplines together and to form friendships. Such events get everyone more involved and have a conversation with each other.

> I know we tried to do for in the past, I've seen meetings that are kind of more disciplinary style meetings and things or just even social events, just to get us talking, if you're more of a friendly relationship with the other staff members, they are probably going to be more willing to listen to suggestion because you're kind of friends. Whereas if you don't interact on a social basis, and makes it a little bit harder, there's probably a little more friction there. So, trying to involve and just have a conversation, right? (10:18)

In general, even though the team works well together, there are opportunities for further strengthening the bonds between disciplines. FL23, a nurse, suggested having team building exercises to enhance teamwork.

> We do need to, I think, just in general, team … we need a type of team building that could, would be beneficial in any way, even though we do for the most part work well together? (23:21)

Rehab nursing differs from medical or surgical nursing and deserves to be recognized as a specialized nursing profession. FL2 felt that there was a lack of recognition of nurses' work in a rehab environment due to the intensive therapy provided by therapists who work one-on-one with the patients. She would like to see more recognition of their profession by the community members as well as other disciplines.

> Actually, when you talk to them, it's amazing how much they talk about how good they talk about the therapists. And sometimes I feel jealous because they say, "Oh, this place is the best for therapy." Now I'm like, "How about me?" But in their mind. I think we are all grouped up through the therapy. (2:25)

Leadership

The participants were appreciative of their leaders but would like to see more of their involvement in patient safety and fall prevention. Adequate staffing is the biggest issue that the participants perceived as affecting patient safety.

FL2 was a nurse who would like the management to be rounding on them and appreciate what they do and solicit their feedback on what worked well. She related her experience with a nursing coordinator who took her initiative to champion the prevention of falls and promised to celebrate with a pizza party if they could achieve zero falls for 15 days. The initiative kept everyone motivated to prevent falls.

> Yeah, and it also gives kind of bias that, "We are good, we did not get any fall." But if there is a little bit of communication, then we can just, "Hey, how did you do? How did you get out of January month without a fall in your shift?" So, … just to put the team more cohesive. We are already united in doing the same thing, but I think it is a small thing like this that would help. (2:14)

FL2, a nurse, appreciated her nursing coordinator who was a unit leader to lead the initiative to prevent falls. However, she would also like to see more involvement from higher level leaders such as managers and senior management. They feel appreciated with small celebrations of success.

> …, because the coordinator I'm saying she does it by choice. She was not asked to be monitoring fall every month, that is her own choice. Yes, she just came up with the idea that every month I will be gathering data of what happened. And now we have another system that we count; there was even some incentive that after 15 days if we are free from fall, we get pizza to celebrate. And it was the 11th that day, I believe, or the 13th

> day someone fell and, everybody gave up. We were just like, "Oh, we missed pizza." But it was not from the management. It was from one of the coordinators. (2:28)

FL2 suggested appointing a staff member to be a champion for falls to further enhance teamwork.

> Yeah, and I would say it would also help to just come up with like, a specific person who would be a position that this is like in charge of falls, monitoring falls like, I do not know how to ….it's like making a little, not a committee necessary but someone who is in charge of monitoring. (2:27)

Several participants, both therapists, and nursing suggested having a peer team member be appointed as a fall champion. By allowing frontline staff to champion, the cause would boost the morale for the team members.

> Because a lot of times people have their perception, "Oh, management was just complaining about this or that" because they are an authority figure. But if you get that peer, who's at the same level as you working on the floor with you, to have input, and then you pick someone who knows what it's like, day to day, seize the day to day struggles, they might have some good impact or input into our meetings, as well as being able to champion the cause. And … gives them probably a little more feeling of "Hey, I'm respected," I'm just not a nursing tech, kind of doing all the dirty work behind the scenes, but they respect me enough to involve me in these meetings. And it kind of gives them a boost of confidence that, "Hey, I can do more than just your run of the mill type of job." (10:14)

The participants sought for rewards and recognition and suggested using incentive and small prizes to energize the team efforts.

> ... I think people are motivated by kinda like a reward system. So if you go X number of days without some sort of an event, "Hey, we're gonna do this for you. We are giving you some initiative, something to focus on or steer your energy towards that goal. So, if we go 14 days without a fall or some sort of an incident, you'll get X, Y or Z. Yeah, or have some kind of prizes, pizza party, something simple, nothing extravagant. But just something to say, "Hey, you're doing a good job. We recognize that you are, you know, holding to the expectation that we have set for you." (10:22)

FL10, who was an occupational therapist, would like to see more frontline staff involved in patient fall committee. She felt that by engaging frontline staff in discussing fall prevention, they would feel more accountable. It also allowed frontline staff to provide input. Peer coaching was much better received than counseling from management.

> …, like in our falls meetings, we have a lot of management in the meetings. And then we have one or two therapy staff in the meetings, we don't have a lot of representation from nursing, like floor nurses, or nursing techs. And I think it would help hold them more accountable and maybe have them appreciate the severity of the situation if they were more engaged in the process or the quality control. … So if we could maybe have more nursing …, or floor staff and tech to give your input …, to have input. And then if you pick the right person to be involved, …, this one person is an excellent tech, and everybody on the staff looks up to that person, and they are a mentor to other staff members. Use them as kind of your representative, and to pass on the message. They might be more accepting of hearing things from a peer than from management. (10:13)

Leaders are responsible for corrective actions when an error happens. The method in which counseling is done affects the staff. FL1, a nurse, suggested targeted counseling to hold the

responsible party accountable was more effective than an electronic message to the whole team. The person who did the mistake may never understand that he or she has done anything wrong. On the other hand, a conscientious staff member who was responsible for the event may feel offended that all the team members were aware of his or her mistake.

> … instead of coming to the person and saying, you did this particularly wrong, let me educate you. They educate everybody. So then everybody assumes they're the ones that are doing something wrong. And it might not necessarily be if they're doing something wrong. (1:21)

One of the biggest challenges in the mind of the participants was adequate staffing and staffing efficiencies. All of the nursing participants would like management to consider staffing by acuity to balance out their assignments. However, such staffing model can be a drawback if the patients are not in the same cluster. FL5, a nurse, believed in a holistic approach towards patient care and would like to spend more time with patients.

> Yes, and we used to do that before then they stopped doing it. But I think that's a good indicator of when you staff based on acuity as opposed to just a number, that I think you get a better picture of what's actually going on and why you need to kind of re-assign some patients, because they get cognitive condition, you have three or four people out of six patients, that's a lot. So you are trying to keep them from falling, or maintain safety in any medications, whatever because you're rushing and you're trying to do the holistic approach to the patient. And sometimes it's just not feasible because you've got too many heavy ones in one assignment. So we need to look at because if you're in charge every day, you need to be able to say, "Hey, this is too much. And we're not just going to put a

room number down; we're actually looking at the amount of care that's required for the patients. (5:35)

Similarly, FL20, an occupational therapist, suggested providing staff with adequate resources such as ancillary staffing, adequate and functional equipment.

> Just ensuring that there's enough staff and if there need to be sitters, one-on-one sitters, and there's enough available and just ensure that the equipment is plentiful, and in good working order. (20:18)

Shift change is a busy period for handoffs from one shift to another. FL23 suggested process change to improve efficiency during shift change.

> And I believe that we need to implement something around shift change time, as far as the collection of phones, we kind of need to set up which shift is responsible, even though both people can be responsible at a shift change, and I think we need to across the board set up a, off going shift has their phone until 7:30, or something like that. We need a rule of thumb to go by for shift change so that some responsible. Sometimes the Secretary will try to click them even before seven o'clock. And I think that's ridiculous. And just something like that to know and continuing to do bedside reporting and things like that. I think we need to focus on some stuff at shift change. (23:13)

Besides nursing staff, ancillary staff who assist with patient care are also essential to supplement staffing for high acuity patients. Essentially, the frontline staff wants their leaders to provide them with the tools to do their jobs.

> Just ensuring that there's enough staff and if there need to be sitters, one-on-one sitters, and there's enough available and just ensure that the equipment is plentiful, and in good working order. (20:18)

Shortage of nursing workforce is a national issue. On top of that, there is a high turnover of nursing staff because they are in demand. Not many nurses understand the functions of rehab nursing, and there is a misconception that it is an easy job. FL1, a nurse, would like to reach out to nursing schools and educate the public about the role of rehab nursing so that they have a better appreciation of this specialty.

> I think our staffing is a huge issue. I think that's something …, they see and recognize, and they're trying to remedy, but it just is not effective. … rehab is a really hard discipline. And I don't think in the field of nursing; it's really well known. I think some people are oriented, thinking, "Oh, you know, at the end of my career, this is going to be an easy ride before I retire." And then they hit the floor, and then they realized, "oh, that is so wrong in so many ways." And I think some people just don't, and the community sometimes doesn't know, unless they've had a family member with a stroke or a spinal cord injury, I don't think the general population realizes that rehab nursing is exactly what we do. So I think if we had an opportunity to educate the community more or go out to the nursing schools and say, "Hey, you're about to graduate and have you ever thought about rehab nursing, and this is what we do." Would be nice to be able to outreach more and get more qualified nurses. If we can get a nursing student here on for really interested in rehab, then that's going to be your next star and on the floor. And yet, longevity is going to be that's the reason why I came to [this organization] is that you had nurses on the floor for 30 – 40 years. You never see that in any other facility, you're going to be doing something right if you have somebody stay in there for that long. (1:24)

Summary

This study used the Interpretive Phenomenological Analysis to look for patterns across the 23 participants. The interviews explored the attitudes of frontline staff towards patient safety culture, with a particular focus on the barriers and facilitators to fall prevention. There were recurring themes amongst the 23 interviews. Within the interviews, staffing issues or human resources seemed to have the most profound impact and effect on participants. Each participant brought up issues of staffing efficiencies such as staffing by acuity and appropriate staffing model as a barrier for them to provide safe care for patients and to prevent falls. When probed further, the themes related to the culture of their organizations began to emerge, such as teamwork, interdisciplinary collaboration, effective communication, leadership support, non-punitive response to errors, and organizational learning. These themes were grouped into seven super-ordinate themes: 1) Patient Safety Culture, 2) Education and Training of Fall Prevention Protocol, 3) Teamwork, 4) Staffing, 5) Communication, 6) Leadership Support, and 7) Interdisciplinary Teamwork and Suggestions from Frontline Staff. These themes correspond with the five specific aims which then answer the overarching research question: How does patient safety culture influence frontline staff's experience with patient fall in an inpatient rehabilitation hospital (IRF) setting? Note that the first specific aim is to ascertain if patient safety culture influences adherence to fall prevention and all seven super-ordinate themes have this corresponding specific aim.

Patient safety culture. Each participant embraced patient safety as their first priority. They had every intention not to harm their patients. They also took pride in their professions and understood their role in an interdisciplinary team. Most of them learned about the fall prevention protocol from their peers as there was no formal education during orientation. The participants

were aware that their patient population consisted of patients with mobility and functional deficits. Therefore, they had to take all sorts of precautions to prevent falls. The participants stressed the need to use critical thinking skills in applying preventive measures based on the patient's physiological condition.

There were two schools of thought between therapy and nursing. The therapists were keen to improve the patient's functional capacity and would push them to be more independent whereas the nurses wanted to ensure they were safe on their own in their room and preferred to limit their unassisted activities. As a result, patients were confused as to what they can and cannot do on their own.

Education and training of fall prevention protocol. It was interesting to hear the definitions of preventable versus non-preventable falls from the participants. Many of them found the question intriguing as it had not occurred in their mind to think about the preventability aspect of the falls. It was easy for them to note patients with an unanticipated change in a physiologic condition such as a heart attack or sudden knee-buckling were non-preventable. They also agreed that preventable falls were those in which preventive measures were not taken given the known fall risk nature of the patients.

On the other hand, if preventive measures were taken but the patient was non-compliant or had cognitive issues such as traumatic brain-injured patients, and the patient did not comply with the precautionary measures, then the fall should be attributed to the non-preventable category. Based on their definitions, the researcher revised the Decision Tree to add one more category of non-preventable falls, as shown in Figure 8 below.

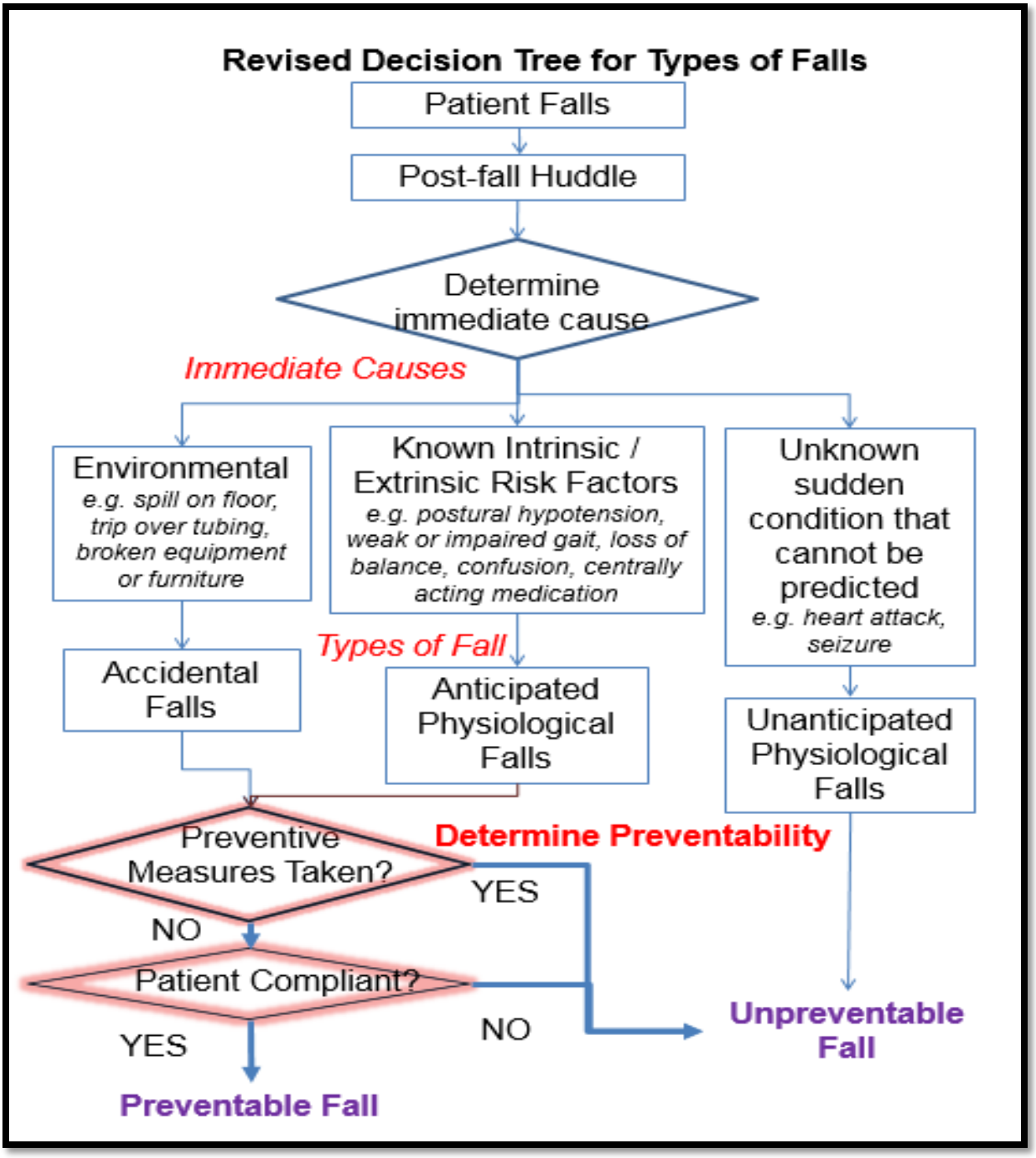

Figure 8. Revised Decision Tree for Types of Falls adapted from VA Algorithm based on input from frontline staff. Two additional conditions to be evaluated before determining preventability of fall – "Preventive Measures Taken" and "Patient Compliant."

Teamwork within and across disciplines. Good teamwork was a theme that resonated with all participants. The participants tended to work well within their discipline but found opportunities to reach out to other disciplines. Therapists generally work during the day shift and did not have as much interaction with the night shift and weekend staff. Therefore, they lacked the opportunity to share their expertise with them. Both therapy and nursing staff suggested cross-disciplinary education so that they can learn from each other. One way for them to get to know one another is through social events such as a lunch meeting where they can socialize and become friends as suggested by FL2, a nurse, FL8, a nursing assistant, and FL10, an occupational therapist.

Communication. Effective communication was an essential element in patient safety. Therapists work with patients individually and have the same patient continuously for the duration of the patient's stay. Therefore, they have a better understanding of the functional progress made by the patient. Nurses practice using the team nursing model, and they may not have the same patient assignments each day. Nurses had to rely on other team members to handoff information about the patient. Therefore, the effective handoff was key to ensuring continuity of information. Personality differences also can become a barrier for some to coach their peers. If the team members do not get along with each other, there will be a breakdown in communication.

Staffing. The nursing staff suggested that their leaders assign patients based on acuity so that their workload could be balanced. This will decrease burnout and improve their morale. Burnout is a response to the chronic emotional stress from juggling multiple priorities, interacting with colleagues with personality differences, and coping with inefficient processes.

Leaders are responsible for developing staffing plans to ensure smooth operations of the department. They ensure the frontline staff are educated on policy and procedures and set clear performance expectations.

Leadership support. Leaders play a role in creating personal accountability by establishing trust and clear performance expectations. Many participants described their leaders as being supportive and open to ideas for improvement. The participants look to their leaders to hold their team members responsible. They appreciate a psychologically safe environment to voice their concerns and non-punitive response to reporting mistakes. When mistakes happen or when there is a reported unsafe condition, the participants would like their leaders to take action and coach those who are responsible for at-risk behaviors. Otherwise, complacency towards unsafe acts may eventually result in harm.

The participants appreciate the positives such as adequate equipment, consistent staffing, good teamwork, excellent communication, and non-punitive environment. Some of the subthemes overlap such as equipment and staffing because they can be both a barrier and a facilitator depending upon which context it is in. For example, broken equipment is a barrier, but adequate equipment is a facilitator.

Ideas on strengthening interdisciplinary collaboration. Themes gathered from the participants' suggestions overlapped with the other super-ordinates which defined the culture of patient safety. The five themes that emerged from their ideas were: communication, process, education, interdisciplinary collaboration, and leadership. They emphasized a more effective cross-discipline communication by using standardized handoff tools such as SBAR (situation, background, assessment, and recommendation) which was already in place in their organizations.

The participants would like to see a streamlined process in which every discipline is consistent in following the fall prevention protocol. They stressed having consistency in practice and adherence to protocol. There was so much variation in practice, and some of the frontline staff lacked the motivation to be responsive towards patients' needs. Several participants suggested having scheduled toileting rounds since they knew most of the falls happen due to the urgency to use the bathroom. They suggested having a falls champion or a dedicated staff member whose duty was to conduct toileting rounds and ensure fall prevention measures were in place for the patients.

With the new electronic medical record system, all disciplines should have more consistent documentation about the fall risks of the patients. Instead of working in silos between nursing and therapy, they suggested educating each other on their roles so that they could learn from each other. One way to promote collaboration across the disciplines is team-building exercise. It allows them the opportunity to interact and form friendships so that they feel comfortable speaking to one another.

These participants would like to see more involvement from their leaders on patient safety. The most important duty of the leaders was to provide adequate staffing. Next would be reward and recognition to boost the employees' morale. They would like the leaders to involve frontline staff in performance improvement projects such as fall prevention task force. Last but not least, the participants want their leaders to hold the staff accountable and address those who were low performers.

At the core of all these super-ordinate themes and subthemes is patient safety culture. Patient safety culture is defined by how the leaders lead the team, remove barriers, provide

resources, educate and implement policies and protocols, and promote teamwork. The super-ordinate themes overlap with one another and can best be illustrated in Figure 9 below.

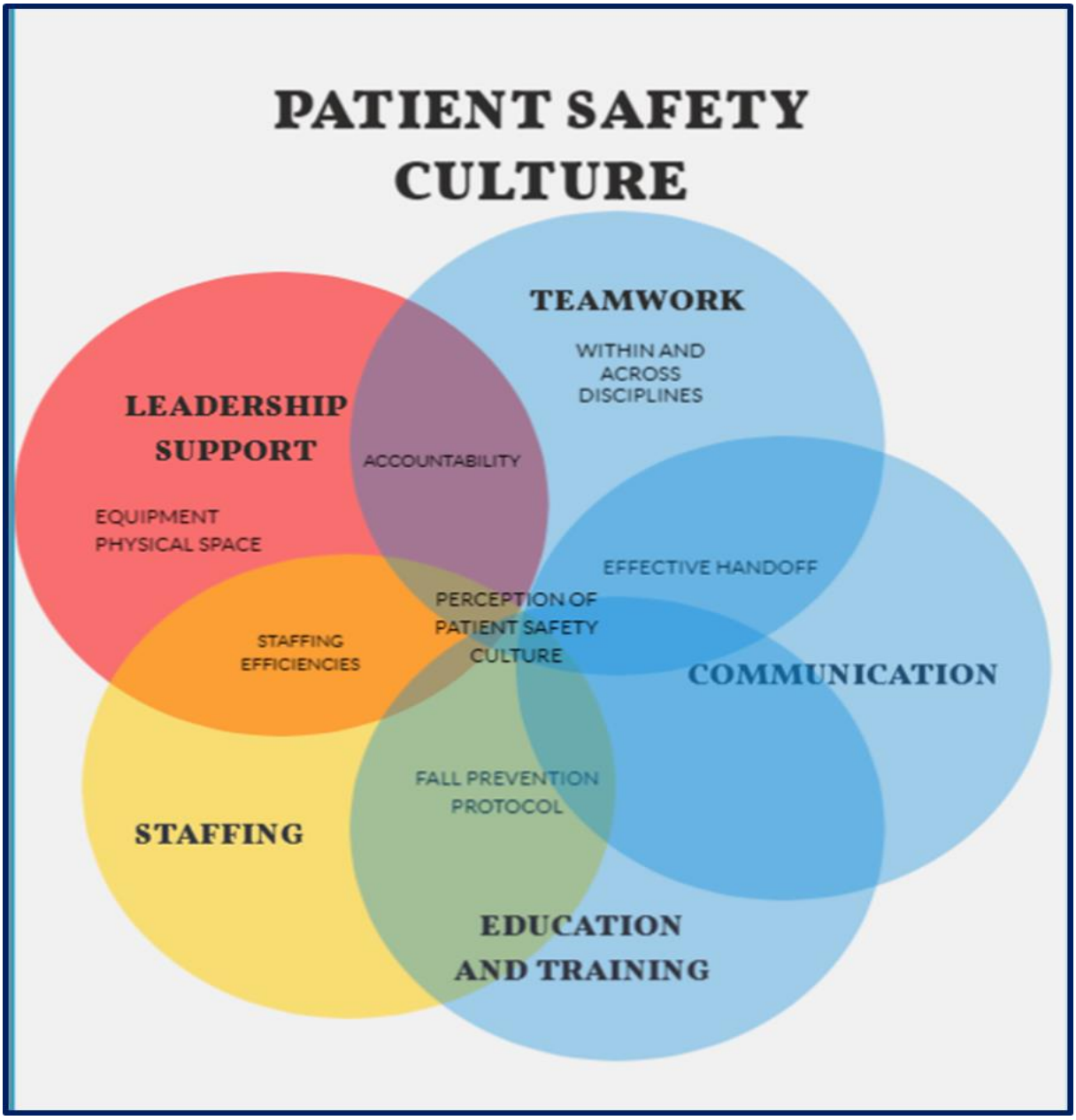

Figure 9. Venn diagram to illustrate the overlapping themes amongst the super-ordinate themes. Patient safety culture is defined by how the leaders lead the team, remove barriers, provide resources, educate and implement policies and protocols, and promote teamwork.

Chapter 6

Discussion

Introduction

The concept of patient safety culture is associated with the shared beliefs and behaviors by the leaders and employees of an organization. Their approach to organizational structures, systems, and tools determines their commitment to safety (Reiman & Rollenhagen, 2014). With the growing attention towards errors in healthcare, many healthcare organizations have made it a priority to establish a culture of safety to prevent accidents by applying high reliability science in designing their processes (Sorra & Dyer, 2010). Leaders set expectations for staff to follow safety procedures and model behaviors that promote patient safety. To continuously improve and ensure safety culture is sustained, leaders will need to periodically assess the status of its existing culture. A patient safety culture survey tool developed by the Agency for Healthcare Research and Quality (AHRQ) is used by many healthcare organizations to assess the perception of staff on 12 dimensions of patient safety culture. The dimensions are related to communication, handoffs and transitions, management support for patient safety, nonpunitive response to error, staffing, manager expectations and actions promoting safety, teamwork across units, and teamwork within units (Sorra & Dyer, 2010).

In an inpatient rehabilitation setting, patient falls is one of the adverse events that results in harm to patients. Most fall prevention efforts are modestly effective and practical if the policies, procedures, and checklists are applied consistently for the patients (Ganz, Huang, Saliba, & Shier, 2013). Despite efforts to decrease patient falls in an intensive rehabilitation

setting, the rates of patient fall and associated injuries continue to be about the same (Forrest, Chen, Huss, & Giesler, 2013). Unfortunately, the sustainability of such efforts is questionable and does not ensure error-free performance (Quigley, 2016). Even though some falls are not preventable, a majority of the falls are considered preventable. Sustaining the efforts requires hardwiring of the processes and an established culture of safety driven by leadership (Chassin, 2018). Hardwiring is a term used to indicate interventions and processes that are consistently practiced by all parties involved that it has become a habit or part of daily operations (Meade, Bursell, & Ketelson, 2006).

This chapter will further discuss how this research fills the gap in literature on the association between dimensions of patient safety culture and fall prevention efforts in a rehabilitation setting. The outline of the discussion chapter include the following: 1) Summary of the Study; 2) Overview of the Problem and Major Findings; 3) Findings related to Human Errors and High Reliability Organization; 4) Specific Inpatient Rehabilitation Facilities (IRF) Challenges; 5) Implication for IRF Setting 6) Study Limitations; 7) Conclusions; 8) Recommendations for Future Research; 9) Concluding Remarks.

Summary of the Study

The purpose of this interpretive phenomenological analysis (IPA) study was to explore the experiences of frontline staff working in an inpatient rehabilitation facility (IRF) on how the patient safety culture of their organizations might have influenced their actions on fall prevention. There are many studies involving the perception of healthcare workers towards patient safety culture such as nurses' perceptions of patient safety culture (Wang, Liu, You, Xiang, Hu, Zhang, Zheng, & Zhu, 2014), and the study of patient safety culture and adverse events (Mardon, Khanna, Sorra, Dyer, & Famolaro, 2010). Mardon et al. (2010) found a positive

correlation between the dimensions of patient safety culture using the AHRQ hospital version of the survey tool and adverse events. Adverse events are measured using patient safety indicators such as decubitus ulcer and falls with fracture. Results of their study indicated that hospitals with more positive culture had lower rates of adverse events (Mardon, Khanna, Sorra, Dyer, & Famolaro, 2010).

In the present study, the researcher interviewed 24 frontline staff in IRF hospitals to gain their perspectives on patient safety culture and their efforts in preventing falls. The objective of this research is to answer the overarching research question: How does patient safety culture influence frontline staff's experience with patient fall in an inpatient rehabilitation hospital (IRF) setting? To answer this research question, the researcher applied a qualitative approach grounded in phenomenological inquiry to study the phenomenon that will fill the gap in the literature. The key feature of this research is to focus on the personal meaning by each participant who shares the same experience of working with rehabilitation patients (Smith et al., 2012).

The seven super-ordinate themes identified were matched to the corresponding specific aims of the study, as shown in Table 4. In the analysis chapter, sub-themes were also identified and presented in details. The participants provided their perceptions and experiences working in their organizations and how they cope with patients with a high risk for falls. They also suggested how their organizations can further integrate patient safety culture into the workplace and decrease patient falls.

Table 4.

Matching specific aims to super-ordinate themes

Specific Aims	**Super-ordinate Themes**
1. This research seeks to ascertain if patient safety culture influence adherence to fall prevention protocol.	#1 – Perception of Patient Safety Culture #2 – Education and Training of Fall Prevention Protocol #3 – Teamwork #4 – Communication #5 - Staffing #6 – Leadership Support
2. To explore the special challenges faced by frontline staff in an IRF setting when taking care of high fall risk patients.	#2 – Education and Training of Fall Prevention Protocol #3A – Teamwork within the discipline #3B – Teamwork across disciplines #4 – Communication #5 – Staffing
3. To identify the factors perceived by frontline staff that has impeded or continue to hamper their ability to prevent falls.	#3 – Teamwork #4 – Communication #5 - Staffing
4. To explore the definition of patient safety culture through the lens of frontline staff.	#1 – Perception of Patient Safety Culture #3 – Teamwork #4 – Communication #5 - Staffing #6 – Leadership Support
5. To recognize the recommendations from frontline staff on how an organization can successfully integrate patient safety culture into their workplace.	#1 – Perception of Patient Safety Culture #4 – Communication

Overview of the Major Findings in this Research

In summary, the super-ordinate themes derived from the qualitative interview data did reveal essential facets of patient safety culture that relate to fall prevention. Although the consistency in the practice of fall prevention protocol was critical in preventing falls, it was not in itself the only dimension that shaped the frontline staff's attitude towards fall prevention.

First of all, it was interesting to note that even though all the participants understood the importance of patient safety and prevention of fall, they were not taught the same fall prevention protocol during orientation. This indicated the lack of systematic organizational learning which is one of the dimensions of patient safety culture in the Agency for Healthcare Research and Quality (AHRQ) survey. These participants indicated that they learned about fall prevention through peer coaching and constant reminders from their leaders. Thus, this could explain why each discipline has a different focus on the types of preventive measures that they use and why most of the therapy staff were unaware of the fall risk assessment done by nursing.

The differences in the type of safety measures that each discipline takes with the patients depends on the amount of interactions with the patients. The nurses follow the AHRQ fall prevention toolkit which provides guidance on universal fall precautions (Ganz et al., 2013). Basically, the elements listed in the universal fall precautions constitute the fall prevention protocol used by the hospitals to keep the patient‘s environment safe and comfortable. Most nurses have five to six patients per shift, and nursing assistants have about eight patients each. If multiple patients need help at the same time, they are unable to respond to each of them simultaneously. Therefore, the nursing staff conducts hourly rounds to check in with the patients and apply monitoring devices such as bed alarms to alert them when patients are moving out of their beds (Ganz et al., 2013). Therapists, on the other hand, apply safety measures based on their

judgment, and their goal is to motivate the patient to regain independence. They also interact with the patients on a one-to-one basis.

Second, there is consistency amongst all three hospitals that the physical therapist is the expert in determining the transfer status of the patient, and they look to the therapist for advice. Transfer status refers to the safe transfer techniques that a healthcare professional needs to use to move a patient from one surface to another (Boninger, 2013). Through the interviews, the researcher gathered from the participants that the patient's transfer status seems to be an essential patient safety factor in an IRF setting, in part due to the types of the patient population that they serve and advice from the physical therapists. Previous literature reviews did not discuss the patient's transfer status as one of the fall prevention strategies because those studies were focused on nursing interventions. Physical therapists perform a fall risk assessment using Berg balance scale and Timed Up and Go tests to measure muscle strength and balance, stability, posture and gait reaction time (Hamm, Money, Atwal, & Paraskevopoulos, 2016). If the patient requires maximum assistance, then the frontline staff are expected to use the lift to transfer them. However, if the lift device is not readily available or the staff chooses not to look for it, it can be a barrier for the frontline staff to transfer the patient safely. One of the participants suggested equipping each patient room with ceiling lifts to make it easier for them to access the device when needed. If the patient is moderately independent, they will use special transfer techniques to move them safely from one level to the next such as from a bed to wheelchair.

Nurses and nursing assistants learn the transfer technique from the therapy staff. Every participant understood the importance of using gait belt as an assistive safety device to help a patient sit, stand or walk around, as well as to transfer them from a bed to a wheelchair and vice versa.

Third, inpatient rehabilitation is for patients who require intensive, interdisciplinary rehabilitation services (Levinson, 2016). Centers for Medicare and Medicaid Services (CMS) require inpatient rehab facilities to have an interdisciplinary team that works together to establish, prioritize, and achieve treatment goals for the patient (Centers for Medicare and Medicaid, 2012). This team meets at least once a week to discuss the plan of care for each patient, which in turn, fosters a good collaborative teamwork amongst the disciplines. Such inpatient programs are designed to improve function and interdisciplinary collaboration is the key to meet the expectations from CMS (Centers for Medicare and Medicaid, 2012). From the interview, FL11, a physical therapist, expressed the need for the team to work jointly with one another, there must be good teamwork and effective communication (11:8).

Teamwork and communication are two dimensions of safety culture that are intertwined. Most of them find that they work well within their department, but there may be slight friction with other departments due to differences in opinions, psychology, schools of thought, and training. Teamwork within and across disciplines works well when there is mutual respect amongst the team members. The participants described personality differences and perceived power distances as being the barriers in teamwork. Differences in personalities and communication styles can cause conflicts and create a hostile environment in the workplace. FL4, a physical therapist, stated that she was reluctant to voice her opinion if the other party had an attitude and did not value her opinion (4:9). Those who use intimidating and aggressive rhetoric can come across as being confrontational to those who are timid. FL1, a nurse, stated that some may perceive an unequal playing field due to power distance between two disciplines when one is dominating the other, such as between a physician and a nurse (1:12).

To provide seamless care, the team members need to relay information about the patient to one another. Thus, handoffs during transitions of care must be standardized to avoid incomplete information. FL4, a physical therapist, had worked elsewhere where standardized handoff such as SBAR (situation, background, assessment, and recommendation) was used to concisely communicate information (4:8). She cautioned that ineffective communication could be a barrier if they misunderstood one another. Another barrier described by FL6, a physical therapist, was time constraint resulting in rushing and providing inadequate information to the next provider. A facilitator of good handoff is effective communication using the whiteboard. FL17, a nurse, relied on the whiteboard for information about a patient's transfer status by a therapist and patient's approved diet by a dietitian. The barriers and facilitators described by the participants resonate with the principles of high reliability in which they are relentless in their pursuit for better work efficiency.

Fourth, when asked what factors continue to hamper their abilities to prevent falls, all of the nursing staff indicated staffing barriers, and a few therapy staff mentioned staffing efficiencies and model of care such as primary nursing versus team nursing. Both disciplines preferred primary nursing so that the same nurse takes care of the same patient for a few days instead of having different patient assignments each day (1:28). Inadequate clinical staff put the burden of care on those who were working, which then led to burnout. Participants described suffering from physical and emotional exhaustion that caused them to have slips and lapses in applying preventive measures for falls. The underlying issues of staffing were high turnover, the lack of trained personnel to mentor new employees, staff who seemed to lack the motivation to do a good job, and the lack of accountability. FL8, a nursing assistant, described inconsistency in precepting new employees, especially if deficient practices from the preceptor was passed on to

the new employees. Others in the team would then have to fix the deficiencies and re-train the new employees (8:21).

Last but not least, the participants described the different styles of leadership as exhibited by their leaders. Some were servant leaders who kept an open door policy and welcomed any feedback and suggestions and were always ready to help resolve problems. Some leaders were not physically present but respond to issues immediately when they find out via emails or phone calls. Four of the participants who were therapists (both physical therapist and occupational therapist) described the lack of presence as a sign of trust by their leaders and preferred to have more autonomy to do their jobs rather than having leaders who micro-manage and hover over their shoulders. The frontline staff does not see their executive-level leaders regularly except during town hall meetings or other formal meetings. Most of the time, they hear from them through newsletters or email announcements. The leader whom they identify with the most is the one who works alongside them during their shift, such as the nursing coordinator or clinical coordinator. A few of them suggested having a peer leader, such as a fall champion.

The participants also expect their leaders to provide a culture of accountability and a psychologically safe environment for them to voice their concerns. The term "accountability" can be viewed as both positive and negative. It is often used synonymously with ownership and commitment to deliver a particular goal. When the outcome is less than expected, holding someone accountable may be associated with blame (Lewis, 2017). To change the mindset from negative to positive, leaders have to first model the behaviors of being personally invested and committed to achieving results that are critical to the success of the organization. Leaders can then set performance standards and hold the staff members to the same standard (Morris, 2012). Goals can be set for the team but it also needs to be broken down into individual objectives.

Individual accountability is the key to organization success (Lewis, 2017). In order to cultivate a culture in which employees have intrinsic motivation and individual accountability, the leaders must foster a psychologically safe environment in which the employees can feel safe to discuss difficult issues and trust that their leaders will not discount them. When leaders provide a fair and just culture, the employees will accept personal responsibility knowing that their leaders will not blame them for failures that were out of their control (Frankel et al., 2017).

The participants look to their leaders to provide them with physical resources such as equipment and physical space for them to do their job well. Inadequate or defective equipment such as lifts, wheelchair alarms, and bed alarms will hamper their efforts in preventing falls. Besides equipment, the physical layout or design of the facility can also be barriers for the staff and patients. Therefore, leaders are the driving force behind the culture of the organization, and they need to secure adequate resources to support the frontline staff in providing safe, and quality care for the patients (McFadden, Henagan, & Gowen, 2009).

These findings were congruent with a mixed-method study done in Canada to assess the facilitators and barriers to implementation of their fall prevention protocol (Zecevic et al., 2017). Zecevic et al. (2017) found that poor safety culture was due to staffing efficiencies, lack of time and resources, and poor communication. However, this study was only done on two units within an acute care hospital even though one of the units selected was a rehabilitation unit.

Findings as they relate to Human Errors and High Reliability Organization

The participants in this research revealed the reasons for not applying the safety measures for those preventable falls. In chapter 5, the participants noted several causes of preventable falls. For example, not turning bed alarms on was an example of skill-based error such as slips and lapses; not applying gait belts during transfers was considered a rule-based error, and not using a

lift to transfer patient was a knowledge-based error. The root causes of skill-based errors were rushing, multi-tasking, and distraction. Rule-based errors happen when the resources are not readily available such as a gait belt, or malfunctioning equipment such as a broken wheelchair alarm, and the staff deviates from protocol by using other workarounds. Knowledge-based errors that result in patient falls can be due to improper transferring technique or lack of critical thinking skills when applying interventions such as not minimizing the drop in blood pressure for a patient with postural hypotension (Quigley et al., 2016). All of these are examples of individual errors.

Teamwork is an essential component in patient safety because it takes the whole team to follow safe practices. Gaps in care happen when there is a deviation from prescribed practices. For example, per fall prevention protocol, a nursing assistant is to stay with the patient while the patient is in the bathroom, and failure to do so might result in patient fall. When a staff member circumvents the protocol and takes short cuts, such bad habits may be picked up by new employees or other employees. Soon, it becomes normalized deviance, and group errors can occur (Banja, 2010). Inadequate resource allocation, such as shortage of staff and insufficient equipment, can also result in group errors.

System errors are associated with leadership support, the use of technology such as electronic medical record, and environment (Makary & Daniel, 2016). If leaders do not hold their staff accountable and continue to permit careless and slovenly habits, it can result in gaps in care and thus, poor outcomes for the patients (Rafter et al., 2015). A well-designed electronic medical record can prevent errors by creating alerts for the end-users. However, if the end-user ignores the alerts and disregards the precautions, it will not only lead to individual error but also system error. An example is barcode scanning to ensure the correct patient is getting the correct

medications. If a nurse scans the wrong patient and the electronic medical record system alerts the nurse about the mismatch, but the nurse ignores the message and continues to proceed with giving the medication, then it becomes a medication error (Tang, Sheu, Yu, Wei, & Chen, 2007).

The wide variation in the use of interventions to prevent falls decreases operational reliability across the different disciplines such as nursing and therapy. Prevention of falls is a complex process and requires coordination of care from all disciplines so that everyone can take appropriate preventive measures. It requires a tight coupling practice that can avoid breakdowns and decrease unwanted variation (Vogus & Singer, 2016). Thus, it makes sense for healthcare providers to adopt principles of high reliability organization to improve outcomes and prevent mistakes (Sutcliffe, Paine, & Pronovost, 2017). The five principles of high reliability organization are a preoccupation with failure; reluctance to simplify interpretations; sensitivity to operations; commitment to resilience; and deference to expertise (Weick & Sutcliffe, 2001).

In this research, the participants offered their suggestions on how to integrate patient safety culture into their workplace. Table 5 below is a summary of the ideas gathered from the frontline staff during the interviews and how they match up to the principles of high reliability organizations.

Table 5.

Suggestions from Frontline Staff as they relate to Principles of High Reliability Organization

Principle	**Suggestions from Frontline Staff**
Preoccupation with failure	• Conduct post-fall huddle to examine root causes of falls and take steps to prevent future falls. • Personal reflection to internalize errors.
Reluctance to simplify	• Ensure process consistency in applying preventive measures across the entire organization. • A better understanding of each other's role by shadowing each other's practice, such as a nurse shadowing a therapist. • Add staffing during a shift change in anticipation of staff being tied up with handoff communication. • Have no distraction during handoff communication. • Enhance teamwork by having a team-building exercise. • Consistent documentation of actions taken to prevent falls in the electronic medical record system so that others are aware.
Sensitivity to operations	• Leaders to acknowledge the preventable falls may happen due to human errors and take steps to prevent human errors. • Peer coaching to teach one another when finding errors. • Nursing coordinator to remind everyone about the use of preventive measures such as gait belts, bed alarms, and wheelchair belt.
Commitment to resilience	• Create a contingency plan by using sitters for patients who are confused or have a tendency to act impulsively. • Cross-training between nursing and therapy in anticipation of those patients who require special transfer techniques.
Deference to expertise	• Everyone looks to the therapists to evaluate patient and determine the safest way to transfer. • Expertise does not follow the chain of command. If the rehab assistant is the one who is most knowledgeable on how the patient transfers, then he or she will be the person to supervise others the best way to transfer the patient. • Leaders welcome suggestions and ideas from staff and encourage communication between disciplines and physicians.

Acute inpatient rehabilitation is meant for patients with complex cognitive and impaired functions, and caring for them requires careful attention to their mobility status. By embracing the principles of high reliability science, IRF can promote patient safety while at the same time, deliver efficient care. Leaders and staff pay close attention to their processes and systems and make no assumptions that current practices are sufficient in preventing harm such as a patient fall. Instead, focus on improving outcomes by reducing variance. When there are gaps in care, it is critical for the leaders to hold proactive discussions with frontline staff and to hear their concerns. Together, they come up with solutions in response to the failures and continually find new solutions. Such resilience and swift problem solving will prevent catastrophes and help create best practices for the rehabilitation setting.

The strong presence of leadership champions is key to the development and maintenance of a high reliability organization. When leaders are visibly involved to remove barriers and focused on improving processes, the frontline staff are more open to speaking up and advocate for better, safer care (Vogus & Sutcliffe, 2007).

Specific IRF Challenges

The fall prevention program in an IRF setting was based on reducing environmental hazards, and anticipated physiologic needs of the patients such as help with transfers and ambulation. IRF is considered an intermediate care after an acute illness, traumatic injury, and surgeries. Most patients who are admitted to an acute rehab setting suffer from stroke, brain injury, debility, amputation, neurologic disorders, spinal cord injury, orthopedic injury, and multiple trauma. Unlike in acute care where the average length of stay for a patient is three to five days, a typical length of stay for an IRF patient is ten to fourteen days, and they undergo intensive therapy at least three hours per day for five days. The aim of inpatient rehabilitation is

for the patient to regain functional independence post rehabilitation or medical intervention. However, the promotion of independence and mobility may also put rehab patients at greater risk of falling (Salamon, Victory, & Bobay, 2012).

Upon admission, the nurse performs a fall risk assessment using Morse fall scale to determine the preventive measures to be taken with the patient based on the risk level. There is a lack of a validated fall risk assessment tool that is suitable for the IRF setting, and almost all patients are scored as high fall risk (Thomas, Pavic, Bisaccia, & Grotts, 2016). The nurse then discusses with the patient and available family member on the importance of patient safety and the need to ask for assistance when transferring or ambulating. Next, the nurse makes sure the room is free of clutter, the call bell is within the patient's reach, and patient's possessions such as glasses, books, and cellphones are kept nearby. The nursing assistant will make sure the patient has non-skid socks on, the yellow bracelet on his/her arm, and signs on the door to alert other disciplines that the patient is at risk for falling. The beds and wheelchairs are fitted with alarms to alert the staff when the patient is trying to get up without assistance. Between the nurse and nursing assistant, they make hourly rounds on the patients and offer to assist the patient to the bathroom every two hours. Additional interventions, such as one-on-one sitter will be used when deemed necessary.

The physical therapist and occupational therapist will evaluate the patient and note the safest way to transfer the patient on the whiteboard. Medications such as narcotics, sedatives, antipsychotic medication, and medications associated with orthostatic hypotension may cause a patient to feel dizzy or disoriented, which then can cause a fall. Pharmacists and physicians review the patients' medications daily and try to minimize the use of such medications. The fall

prevention program follows the recommended practices by the Agency for Healthcare Research and Quality (Agency for Healthcare Research and Quality, 2013).

Besides interacting with nurses, nursing assistants, physical therapists, occupational therapists, and rehabilitation assistants, patients may also interact with speech-language pathologists in their treatment rooms and recreational therapists in outdoor therapy. Unlike being in an acute care setting where patients are mostly confined to their rooms, a rehab patient spends almost four to five hours outside of a patient room. During meal hours such as breakfast, lunch, and dinner, they dine with the other patients in the dining room or open gym area. A fall can happen in a patient's room, the gym, or anywhere within the campus. Thus, all disciplines will have to be alerted to the precautionary steps taken to prevent falls.

Implications for Inpatient Rehabilitation Facilities Setting and Fall Prevention

The frontline staff in an IRF setting finds it challenging to balance between the promotions of independence, which is a fundamental goal of rehabilitation and keeping patients safe from falling. Nurses are often at the forefront of care when a patient is admitted and they use a fall risk screening tool to evaluate and idenfity the risk factors that can increase the chances of a patient fall (Callis, 2016). To mitigate the risks, the nurses will implement interventions to prevent falls per the organization's fall prevention protocol.

Since a fall risk screening tool is essential for nurses to assess the patient's functional and mobility status, several researchers had attempted to find a tool that is appropriate for the rehabilitation setting. Thomas et al. (2016) conducted a retrospective validation study to "evaluate and compare the Morse Fall Scale (MFS) and the Casa Colina Fall Risk Assessment Scale (CCFRA) for identification of patients at risk for falling in an acute inpatient rehabilitation facility." They found that the CCFRA is an adequate tool for fall risk assessment in acute

inpatient rehabilitation facility because it had a higher sensitivity and diagnostic odds than MFS (Thomas et al., 2016). Another group of researchers developed a fall risk assessment tool using the functional independent measures (FIM) which are quality measures used by IRF to assess patient's functional level upon admission and at discharge (Rosario, Kaplan, Khonsari, & Patterson, 2014). Rosario et al. (2014) found that patients with a different diagnosis or impairment groups have different risks for falling, specifically their FIM on toileting, bed transfer, tub/shower transfer, and stairs.

Researchers such as Ang, Mordiffi, and Wong (2011) studied the effectiveness of targeted interventions for fall prevention using randomized controlled trial. They found that hospital units that used multiple targeted interventions based on patient's risk for falls had lower incidences of fall (Ang et al., 2011). Even though their study provided good evidence that appropriate interventions used by hospital staff did lower incidences of fall, it did not measure long term adherence to the targeted interventions. The question remained on whether human factors and systems design affect adherence to protocol. Human factors refer to the physical and mental capabilities of individuals and how their interactions with other individuals influence their performance in the work environment (Carayon, Wooldridge, Hose, Salwei, & Benneyan, 2018). Deviation from policies and procedures intentionally or unintentionally are related to human factors. Roth, Brewer, and Weick (2016) used a Delphi technique to understand human factors affecting nursing errors. From their research, they found that heavy workload and fatigue were the top two causes of nursing errors (Roth, Brewer, & Wieck, 2016). This study serves to illuminate the human variables and systems design that affects fall prevention for patients in an acute rehabilitation setting. Not only does this study include the viewpoints of nurses but also

those of physical therapists, occupational therapists, nursing assistants, and rehabilitation assistants.

Quigley (2016) described the differences between screening and assessment tools. Morse fall scale is a screening tool to enable the nurse to determine the need for further clinical workup. FIM scoring is considered an assessment tool because it provides essential clinical information for a clinician to make a differential diagnosis (Quigley, 2016). Quigley (2016) suggested eliminating fall risk screening tool as it was not a value-added task for nurses. Instead, it would be more useful to use an interdisciplinary approach to conduct a multifactorial assessment. Indeed, the findings from this research support combining the skills of nursing and therapy in assessing the patients and come up with appropriate interventions suitable for that patient's impairment or condition.

Besides using appropriate assessment tools, adequate equipment that is readily accessible must be made available for the frontline staff. IRF hospitals may want to consider installing ceiling lifts in each patient room to facilitate a safe transfer at all times rather than to hunt for a mobile lift that is shared by many. The frontline staff may also want to engage and educate the patient's family on the safety precautions

Study Limitations

There are several limitations to this study. First, although it is essential to capture the voices of clinical staff, interviewing employees can be challenging. Employees often are reluctant to express themselves and provide in-depth explanations, which are the two key components of qualitative research.

In some cases, employees do not want to tell the truth for fear of repercussions, making it hard to identify the specific context of their descriptions. The findings in this research may be

limited by the fact that not all disciplines that may directly interact with patients will be interviewed. However, it should be remembered that nurses and nursing technicians mostly perform acts of implementing fall prevention strategies. In this research from which frontline staffs were selected, 60% of the participants were expected to be nursing staff because the ratio of nursing hours to therapy hours is approximately 5 to 1. The actual participation ratio was 48% nursing to 52% therapy staff.

Second, this researcher is new to qualitative research and has a learning curve in analyzing the data using interpretative phenomenological analysis. There is only one interview per participant with no follow-up interviews to seek clarification. This researcher also works in one of the organizations which may cloud her interpretation of meaning conveyed by the participants.

Lastly, this study focused specifically on the views of frontline clinical staff who are involved in preventing falls. The preferences of other employees who are not involved in the interviews may be different. There are also other disciplines such as pharmacists, physicians, case managers, and environmental services aides who may have other views about fall prevention and patient safety culture within the organization.

Conclusions

As evidenced by this research, clinician accountability is identified as the key to the successful implementation of patient safety strategies. If there is a culture of accountability, the staff will hold themselves accountable for the implementation of fall prevention in their plan of care. Sustaining a patient safety culture requires relentless pursuit by the leaders in setting expectations, engaging the staff by listening to their thoughts about the processes and operations, and implementing process improvements that make sense to the frontline staff. Effective leaders

promote a culture of safety and create staff "buy-in" with every initiative so that there is a sense of procedural ownership and thereby, motivate the frontline staff in keeping up with learning and ongoing performance improvement.

Not all falls are preventable, but for those that are preventable, a multifactorial fall prevention program that is developed using the expertise of a multidisciplinary team may be the solution to prevent falls. Teamwork is very important, and team members need to embrace their differences and resolve conflict with mutual respect and purpose. Interdisciplinary collaboration can be enhanced if everyone keeps an open mind and learn from each other. Team members rely on one another to provide continuity of care, and thus, effective communication is an important component in reducing gaps in care.

A culture of safety must also address the provision of resources to reduce frustration and stress, which can cause burnout. Adequate staffing is needed to cope with the increasing demands of the patients. When designing the staffing schedule, leaders need to take human factors into account, and the geographic location of the patients so that the workflow is efficient for each employee. Often, it is an inefficient workflow that causes the staff to feel that there is not enough help. The frontline staff also need proper functioning equipment to carry out their job. If the equipment is not readily available, the frontline staff will have to waste time searching for it and may compromise care. The well-being of the employees is just as important as caring for patients. They need reward and recognition as a form of motivation to sustain good performance.

In conclusion, Figure 10 below provides a framework to integrate all factors influencing patient safety culture and provides a foundation for an inpatient rehabilitation facility to develop a patient safety program.

Figure 10. Framework for patient safety culture

Recommendations for Further Research

This research focused on the perspectives of frontline staff. While it is important to understand the challenges faced by the sharp end, healthcare leaders at the blunt end may have a different set of priorities that they have to contend with such as regulatory compliance, budgetary concerns, and the global shortage of healthcare professionals. With the evolving healthcare environment, leaders are under increased pressure to reduce the variability of care and ensure clinical competency. Thus, there is an opportunity for future research to integrate the thoughts of leaders and frontline staff to come up with a robust fall prevention program that can get to zero preventable falls.

Specifically for inpatient rehabilitation facilities setting, there is an opportunity for future research to combine the expertise of both nursing and therapy in creating a more meaningful fall risk assessment so that patients are categorized into appropriate fall risk levels and interventions are based on the needs of the patient. Current fall risk assessment tools used by nursing is developed for a general acute care population, which makes every rehab patient a high fall risk patient based on the scores. If every patient is a high fall risk patient, then there will be cognitive overload in which the frontline staff will not be able to mentally prioritize which patients need more attention and which preventive measures to choose first (Fournier et al., 2019). Inpatient rehabilitation facilities may want to combine nursing and therapy risk assessment tools to come up with an appropriate fall risk score for different types of patients and establish transfer status based on mobility and physiological conditions.

Concluding Remarks

It is imperative that healthcare organizations recognize the importance of frontline staff to the overall success of the organization's patient safety program. These participants have provided useful insights into how they deliver care to their patients and coordinate care amongst their colleagues. Involving the frontline staff in co-designing fall prevention program will help identify unmet needs and educational deficits.

The barriers identified by the frontline staff is the key to understanding the nature of their work, the failure modes that can occur in their environment, and the hazardous conditions that they have to deal with. Leaders can anticipate the risks and hazards through soliciting feedback from their staff and then work to prevent mishaps by standardizing workflow or reinvent processes that remove uncertainties and variation in care delivery.

As demonstrated through the words of the frontline staff in this research, there is a lot of variability amongst the four disciplines. Imagine how much more complex it can be when more disciplines are added into the mix. Given healthcare's complexity and variability, it is challenging to craft policy or protocol for fall prevention that suits every patient's needs. However, the frontline staff suggested some processes that can be hardwired such as toileting rounds, use of gait belt with every patient to provide support when they lose their balance, and ensuring patients are transferred appropriately using the right equipment. Sustaining a safety culture requires leaders to hold their staff accountable, be present to offer support, and to promote the use of safety measures on every patient.

The researcher is hopeful that inpatient rehabilitation facilities will get to zero preventable falls. It starts with leaders acknowledging the high-risk nature of the IRF patient population and the determination to achieve safe operations. Leaders can support patient safety efforts by committing resources to address safety concerns and use the principles of high reliability organization to create a non-punitive environment that promotes a culture of accountability.

References

Agency for Healthcare Research and Quality. (2013). Preventing Falls in Hospitals. Retrieved August 31, 2018, from http://www.ahrq.gov/professionals/systems/hospital/fallpxtoolkit/fallpxtkover.html

AHRQ. (2017). Systems Approach. Retrieved April 29, 2018, from https://psnet.ahrq.gov/primers/primer/21/systems-approach

Alekna, V., Stukas, R., Tamulaityte-Morozoviene, I., Šurkiene, G., & Tamulaitiene, M. (2015). Self-reported consequences and healthcare costs of falls among elderly women. *Medicina (Lithuania)*, *51*(1), 57–62. https://doi.org/10.1016/j.medici.2015.01.008

Alverzo, J. P. (2016). Reducing the Incidence of Falls: The Never-ending Journey. *Rehabilitation Nursing*, *41*, 3–4.

Ang, E., Mordiffi, S. Z., & Wong, H. B. (2011). Evaluating the use of a targeted multiple intervention strategy in reducing patient falls in an acute care hospital: A randomized controlled trial. *Journal of Advanced Nursing*, *67*(9), 1984–1992. https://doi.org/10.1111/j.1365-2648.2011.05646.x

Banja, J. (2010). The normalization of deviance in healthcare delivery. *Business Horizons*, *53*, 139–148. https://doi.org/10.1016/j.bushor.2009.10.006

Barker, A. L., Morello, R. T., Wolfe, R., Brand, C. A., Haines, T. P., Hill, K. D., … Kamar, J. (2016). 6-PACK programme to decrease fall injuries in acute hospitals: cluster randomised controlled trial. *British Medical Journal*, *352*(h6781), 1–9. https://doi.org/10.1136/bmj.h6781

Bell, S. K., Delbanco, T., Anderson-Shaw, L., McDonald, T. B., & Gallagher, T. H. (2011). Accountability for medical error: Moving beyond blame to advocacy. *Chest*, *140*(2), 519–526. https://doi.org/10.1378/chest.10-2533

Black, A. A., Brauer, S. G., Bell, R. A., Economidis, A. J., & Haines, T. P. (2011). Insights into the climate of safety towards the prevention of falls among hospital staff. *Journal of Clinical Nursing*, *20*(19–20), 2924–2930. https://doi.org/10.1111/j.1365-2702.2010.03535.x

Bloomberg, L. D., & Volpe, M. (2008). *Completing Your Qualitative Dissertation. A Roadmap from Beginning to End.* (V. Knight & S. Conelly, Eds.) (1st ed.). Thousand Oaks: Sage Publications, Inc.

Boninger, M. L. (2013). Safe Transfer Technique. *Archives of Physical Medicine and Rehabilitation*, *94*(12), 2579–2580. https://doi.org/10.1016/j.apmr.2013.04.007

Bonner, A. F., Castle, N. G., Men, A., & Handler, S. M. (2009). Certified Nursing Assistants' Perceptions of Nursing Home Patient Safety Culture: Is There a Relationship to Clinical Outcomes? *Journal of the American Medical Directors Association*, *0*(0), 11–20. https://doi.org/10.1016/j.jamda.2008.06.004

Breimaier, H. E., Halfens, R. J., & Lohrmann, C. (2015). Effectiveness of multifaceted and tailored strategies to implement a fall-prevention guideline into acute care nursing practice: a before-and-after, mixed-method study using a participatory action research approach. *BMC Nursing*, *14*(18), 1–12. https://doi.org/10.1186/s12912-015-0064-z

Bunn, F., Dickinson, A., Barnett-Page, E., McInnes, E., & Horton, K. (2008). A systematic review of older people's perceptions of facilitators and barriers to participation in falls-prevention interventions. *Ageing and Society*, *28*, 449–472. https://doi.org/10.1017/S0144686X07006861

Burns, E., Stevens, J., & Lee, R. (2016). The direct costs of fatal and non-fatal falls among older adults - United States. *Journal of Safety Research*, *58*(2016), 99–103. https://doi.org/10.1016/j.jsr.2016.05.001

Callis, N. (2016). Falls prevention: Identification of predictive fall risk factors. *Applied Nursing Research*, *29*(2016), 53–58. https://doi.org/10.1016/j.apnr.2015.05.007

Campbell, B. (2016). Patient falls: Preventable, not inevitable. *Nursing Made Incredibly Easy*, *14*(1), 14–18. https://doi.org/10.1097/01.NME.0000475168.08103.37

Cannon, M. D., & Edmondson, A. C. (2005). Failing to learn and learning to fail (intelligently): How great organizations put failure to work to innovate and improve. *Long Range Planning*, *38*(2005), 299–319. https://doi.org/10.1016/j.lrp.2005.04.005

Carayon, P., Wooldridge, A., Hose, B. Z., Salwei, M., & Benneyan, J. (2018). Challenges and opportunities for improving patient safety through human factors and systems engineering. *Health Affairs*, *37*(11), 1862–1869. https://doi.org/10.1377/hlthaff.2018.0723

Castel, E. S., Ginsburg, L. R., Zaheer, S., & Tamim, H. (2015). Understanding nurses' and physicians' fear of repercussions for reporting errors: clinician characteristics, organization demographics, or leadership factors. *BMC Health Services Research*, *15*(326), 1–10. https://doi.org/10.1186/s12913-015-0987-9

Centers For Medicare & Medicaid Services. (n.d.). Conditions of Participation. Retrieved June 17, 2018, from http://www.gpo.gov/fdsys/pkg/CFR-2010-title42-vol5/pdf/CFR-2010-title42-vol5-sec

Centers for Medicare and Medicaid. (2012). Inpatient Rehabilitation Therapy Services: Complying with Documentation Requirements. Retrieved November 30, 2017, from https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-

MLN/MLNProducts/downloads/Inpatient_Rehab_Fact_Sheet_ICN905643.pdf

Chassin, M. R. (2018, March). Zero Harm: An Achievable Goal. *Healthcare Executive*, 1–4.

Chassin, M. R., & Loeb, J. M. (2013). High-Reliability Health Care: Getting There from Here. *The Milbank Quarterly*, *91*(3), 459–490. https://doi.org/10.1111/1468-0009.12023

Chera, B. S., Mazur, L., Buchanan, I., Kim, H. J., Rockwell, J., Milowsky, M. I., & Marks, L. B. (2015). Improving patient safety in clinical oncology: Applying lessons from normal accident theory. *JAMA Oncology*, *1*(7), 958–964. https://doi.org/10.1001/jamaoncol.2015.0891

Clancy, A., & Mahler, M. (2016). Nursing staffs' attentiveness to older adults falling in residential care - an interview study. *Journal of Clinical Nursing*, *25*(9–10), 1405–1415. https://doi.org/10.1111/jocn.13240

Cooperrider, D., Whitney, D., & Stavros, J. (2008). *Appreciative inquiry handbook for leader of change*. (Roger Williams, Ed.) (2nd ed.). Brunswick: Crown Custom Publishing, Inc.

Cope, D. (2014). Methods and Meanings: Credibility and Trustworthiness of Qualitative Research. *Oncology Nursing Forum*, *41*(1), 89–91.

Cox, J., Thomas-Hawkins, C., Pajarillo, E., DeGennaro, S., Cadmus, E., & Martinez, M. (2015). Factors associated with falls in hospitalized adult patients. *Applied Nursing Research*, *28*(2), 78–82. https://doi.org/10.1016/j.apnr.2014.12.003

Creswell, J. (2014). *Research Design Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). California: Sage.

Creswell, J., & Poth, C. (2018). *Qualitative Inquiry and Research Design* (4th ed.). Los Angeles: Sage.

Currie, L. (2008). *Patient safety and quality: An evidence-based handbook for nurses, Chapter*

10. Fall and injury prevention. (R. G. Hughes, Ed.). Rockville: Agency for Healthcare Research and Quality.

Edmondson, A. (2003). Speaking Up in the Operating Room: How Team Leaders Promote Learning in Interdisciplinary Action Teams. *Journal of Management Studies*, *40*(6), 1420–1452.

Edmondson, A. (2011, April). Strategies for learning from failure. *Harvard Business Review*, 49–56.

Edmondson, A. C. (2002). The local and variegated nature of learning in organizations. *Organization Science*, *13*(2), 128–146. https://doi.org/10.1287/orsc.13.2.128.530

Edmondson, A. C. (2004). Learning From Mistakes Is Easier Said Than Done Group and Organizational Influences on the Detection and Correction of Human Error. *The Journal of Applied Behavioral Science*, *40*(1), 66–90. https://doi.org/10.1177/0021886304263849

Edmondson, A. C., & Nembhard, I. M. (2009). Product development and learning in project teams: The challenges are the benefits. *Journal of Product Innovation Management*, *26*, 123–138. https://doi.org/10.1111/j.1540-5885.2009.00341.x

Fischer, C. (2009). Psychotherapy Research. *Psychotherapy Research*, *19*(4–5), 583–590. https://doi.org/10.1080/10503300902798375org/10.1080/10503300902798375

Forrest, G. P., Chen, E., Huss, S., & Giesler, A. (2013). A comparison of the functional independence measure and morse fall scale as tools to assess risk of fall on an inpatient rehabilitation. *Rehabilitation Nursing*, *38*(4), 186–192. https://doi.org/10.1002/rnj.86

Fournier, L. R., Coder, E., Kogan, C., Raghunath, N., Taddese, E., & Rosenbaum, D. A. (2019). Which task will we choose first? Precrastination and cognitive load in task ordering. *Attention, Perception, and Psychophysics*, *81*(2), 489–503. https://doi.org/10.3758/s13414-

018-1633-5

Frankel, A., Haraden, C., Federico, F., & Lenoci-Edwards, J. (2017). *A Framework for Safe, Reliable, and Effective Care*. *Institute for Healthcare Improvement and Safe*. Cambridge.

Frese, M., & Keith, N. (2015). Action Errors, Error Management, and Learning in Organizations. *Annual Review of Psychology*, *66*, 661–687. https://doi.org/10.1146/annurev-psych-010814-015205

Friese, S. (2014). *Qualitative Data Analysis with ATLAS.ti*. (L. M. Katie Metzler, Ed.) (2nd ed.). London: Sage Publications.

Frisina, P., Guellnitz, R., & Alverzo, J. (2010). A time series analysis of falls and injury in the inpatient rehabilitation setting. *Rehabilitation Nursing*, *35*(4), 141–146.

Ganz, D. A., Huang, C., Saliba, D., & Shier, V. (2013). Preventing Falls in Hospitals A Toolkit for Improving Quality of Care. In *Agency for Healthcare Research and Quality* (Vol. 13).

Garrard, L., Boyle, D. K., Simon, M., Dunton, N., & Gajewski, B. (2016). Reliability and Validity of the NDNQI® Injury Falls Measure. *Western Journal of Nursing Research*, *38*(1), 111–128. https://doi.org/10.1177/0193945914542851

Gliklich, R., Dreyer, N., & Leavy, M. (2014). *Registries for Evaluating Patient Outcomes: A User's Guide*. (R. Gliklich, N. Dreyer, & M. Leavy, Eds.) (3rd ed.). Rockville: Agency for Healthcare Research and Quality. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK208608/

Goodman, P. S., Ramanujam, R., Carroll, J. S., Edmondson, A. C., Hofmann, D. A., & Sutcliffe, K. M. (2011). Organizational errors: Directions for future research. *Research in Organizational Behavior*, *31*, 151–176. https://doi.org/10.1016/j.riob.2011.09.003

Griffin, F., & Resar, R. (2009). *IHI Global Trigger Tool for Measuring Adverse Events*. *IHI*

Innovation Series White Paper. Massachusetts.

Hamm, J., Money, A. G., Atwal, A., & Paraskevopoulos, I. (2016). Fall prevention intervention technologies: A conceptual framework and survey of the state of the art. *Journal of Biomedical Informatics*, *59*(2016), 319–345. https://doi.org/10.1016/j.jbi.2015.12.013

Hempel, S., Newberry, S., Wang, Z., Booth, M., Shanman, R., Johnsen, B., … Ganz, D. A. (2013). Hospital fall prevention: A systematic review of implementation, components, adherence, and effectiveness. *Journal of the American Geriatrics Society*, *61*, 483–494. https://doi.org/10.1111/jgs.12169

Hendrich, A. (2007). How to try this: predicting patient falls. Using the Hendrich II Fall Risk Model in clinical practice. *The American Journal of Nursing*, *107*(11), 50–58.

Heron, M. (2017). *Death: Leading Causes for 2015*. *National Vital Statistics Report* (Vol. 66).

Hicks, D. (2015). Can Rounding Reduce Patient Falls in Acute Care? An Integrative Literature Review. *MedSurg Nursing*, *24*(1), 51–55.

Johnson, M., Kelly, L., Siric, K., Tran, D. T., & Overs, B. (2015). Improving falls risk screening and prevention using an e-learning approach. *Journal of Nursing Management*, *23*(7), 910–919. https://doi.org/10.1111/jonm.12234

Joo, H., Wang, G., Yee, S. L., Zhang, P., & Sleet, D. (2017). Economic Burden of Informal Caregiving Associated With History of Stroke and Falls Among Older Adults in the U.S. *American Journal of Preventive Medicine*, *53*(6S2), S197–S204. https://doi.org/10.1016/j.amepre.2017.07.020

Koh, S., Manias, E., Hutchinson, A., Donath, S., & Johnston, L. (2008). Nurses' perceived barriers to the implementation of a Fall Prevention Clinical Practice Guideline in Singapore hospitals. *BMC Health Services Research*, *8*(105), 1–10. https://doi.org/10.1186/1472-6963-

8-105

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

Kramarow, E., Chen, L.-H., Hedegaard, H., & Warner, M. (2015). Deaths From Unintentional Injury Among Adults Aged 65 and Over: United States, 2000–2013 Key findings Data from the National Vital Statistics System (Mortality). *NCHS Data Brief* ■, (199).

Lake, E. T., Shang, J., Klaus, S., & Dunton, N. E. (2010). Patient falls: Association with hospital Magnet status and nursing unit staffing. *Research in Nursing & Health*, *33*, 413–425. https://doi.org/10.1002/nur.20399

Lawton, R., Carruthers, S., Gardner, P., Wright, J., & McEachan, R. (2012). Identifying the latent failures underpinning medication administration errors: An exploratory study. *Health Services Research*, *47*(4), 1437–1459. https://doi.org/10.1111/j.1475-6773.2012.01390.x

Leape, L. L. (2015). Patient Safety in the Era of Healthcare Reform. *Clinical Orthopaedics and Related Research*, *473*(5), 1568–1573. https://doi.org/10.1007/s11999-014-3598-6

Leone, R. M., & Adams, R. J. (2016). Safety standards: Implementing fall prevention interventions and sustaining lower fall rates by promoting the culture of safety on an inpatient rehabilitation unit. *Rehabilitation Nursing*, *41*(1), 26–32. https://doi.org/10.1002/rnj.250

Levinson, D. R. (2016). *Adverse Events In Rehabilitation Hospitals: National Incidence Among Medicare Beneficiaries*. *Department of Health and Human Services*. Washington D.C.

Lewis, C. A. (2017). Creating a Culture of Accountability. *Leader to Leader*, *2017*(84), 12–16. https://doi.org/10.1201/b15799-12

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills: Sage.

Makary, M., & Daniel, M. (2016). Medical error—the third leading cause of death in the US. *BMJ*, *353*(2139), 1–5. https://doi.org/10.1136/bmj.i2139

Mardon, R. E., Khanna, K., Sorra, J., Dyer, N., & Famolaro, T. (n.d.). Exploring Relationships Between Hospital Patient Safety Culture and Adverse Events.

Mardon, R. E., Khanna, K., Sorra, J., Dyer, N., & Famolaro, T. (2010). Exploring Relationships Between Hospital Patient Safety Culture and Adverse Events. *Journal of Patient Safety*, *6*(4), 226–234.

McFadden, K. L., Henagan, S. C., & Gowen, C. R. (2009). The patient safety chain: Transformational leadership's effect on patient safety culture, initiatives, and outcomes. *Journal of Operations Management*, *27*(2009), 390–404. https://doi.org/10.1016/j.jom.2009.01.001

Meade, C., Bursell, A., & Ketelsen, L. (2006). Effects of Nursing Rounds. *American Journal of Nursing*, *106*(9), 58–71.

Miake-Lye, I. M., Hempel, S., Ganz, D. A., & Shekelle, P. G. (2013). Inpatient Fall Prevention Programs as a Patient Safety Strategy A Systematic Review. *Ann Intern Med*, *158*, 390–396. Retrieved from www.annals.org

Mihaljcic, T., Haines, T. P., Ponsford, J. L., & Stolwyk, R. J. (2017). Investigating the relationship between reduced self-awareness of falls risk, rehabilitation engagement and falls in older adults. *Archives of Gerontology and Geriatrics*, *69*(2017), 38–44. https://doi.org/10.1016/j.archger.2016.11.003

Morello, R. T., Barker, A. L., Ayton, D. R., Landgren, F., Kamar, J., Hill, K. D., … Stoelwinder, J. (2017). Implementation fidelity of a nurse-led falls prevention program in acute hospitals during the 6-PACK trial. *BMC Health Services Research*, *17*(383), 1–10.

https://doi.org/10.1186/s12913-017-2315-z

Morris, S. (2012). A culture of accountability. *Oilweek*, *63*(3), 73–74. https://doi.org/10.1016/j.carpath.2005.08.008

Morse, J. (2009). *Preventing patient falls: Establishing a fall intervention program* (2nd ed.). New York: Springer Publishing Company.

Muhammad, H., Madiha, I., & Kanza, A. (2015). Linking Personality and Knowledge Sharing Behavior : The Moderating Role of Team Work Culture. *NUML International Journal of Business & Management*, *10*(1), 43–63.

Murphy, J., & Quigley, P. (2015). Understanding the VA Fall Reduction Program. *Topics in Patient Safety*, *15*(4), 1–4.

Nembhard, I., & Edmondson, A. (2006). Making it safe: The effects of leader inclusiveness and professional status on psychological safety and improvement efforts in health care teams. *Journal of Organizational Behavior*, *27*, 941–966. https://doi.org/10.1002/job.413

New Hampshire Department of Health and Human Services. (2010). New Hampshire Preventing Falls—Step by Step Healthy People Objective PHHS Block Grant Funding PHHS Block Grant Coordinator. Retrieved June 17, 2018, from http://www.dhhs.nh.gov/

Neyens, J. C., van Haastregt, J. C., Dijcks, B. P., Martens, M., van den Heuvel, W. J., de Witte, L. P., & Schols, J. M. (2011). Effectiveness and Implementation Aspects of Interventions for Preventing Falls in Elderly People in Long-Term Care Facilities: A Systematic Review of RCTs. *Journal of the American Medical Directors Association*, *12*(6), 410–425. https://doi.org/10.1016/j.jamda.2010.07.018

Padgett, J., Gossett, K., Mayer, R., Chien, W.-W., & Turner, F. (2017). The Qualitative Report Improving Patient Safety through High Reliability Organizations Recommended APA

Citation Improving Patient Safety through High Reliability Organizations. *The Qualitative Report*, *22*(2), 410–425. Retrieved from http://nsuworks.nova.edu/tqr

Perrow, C. (1984). *Normal accidents : Living with high-risk technologies*. (1st ed.). New York: Basic Books.

Perrow, Charles. (2011). *Normal Accidents*. Princeton: Princeton University Press.

Pike, C., Birnbaum, H. G., Schiller, M., Sharma, H., Burge, R., & Edgell, E. T. (2010). Direct and Indirect Costs of Non-Vertebral Fracture Patients with Osteoporosis in the US. *Pharmacoeconomics*, *28*(5), 395–409.

Powell-Cope, G., Quigley, P., Besterman-Dahan, K., Smith, M., Stewart, J., Melillo, C., … Friedman, Y. (2014). A Qualitative Understanding of Patient Falls in Inpatient Mental Health Units. *Journal of the American Psychiatric Nurses Association*, *20*(5), 328–339. https://doi.org/10.1177/1078390314553269

Quigley, P. A. (2016). Evidence levels: Applied to select fall and fall injury prevention practices. *Rehabilitation Nursing*, *41*(1), 5–15. https://doi.org/10.1002/rnj.253

Quigley, P. A., Barnett, S. D., Bulat, T., & Friedman, Y. (2016). Reducing Falls and Fall-Related Injuries in Medical-Surgical Units One-Year Multihospital Falls Collaborative. *J Nurs Care Qual*, *31*(2), 139–145. https://doi.org/10.1097/NCQ.0000000000000151

Rafter, N., Hickey, A., Condell, S., Conroy, R., O'connor, P., Vaughan, D., & Williams, D. (2015). Adverse events in healthcare: Learning from mistakes. *QJM*, *108*(4), 273–277. https://doi.org/10.1093/qjmed/hcu145

Rasmussen, J., Duncan, K. D., & Leplat, J. (1987). *New technology and human error (New technologies and work).* Chichester: New York: J. Wiley.

Rasmussen, Jens. (1997). Risk Management In a Dynamic Society: A Modelling Problem. *Safety*

Science, *273*(2), 183–213.

Reason, J. (1990). *Human Error* (1st ed.). Cambridge: Cambridge University Press.

Reiman, T., & Rollenhagen, C. (2014). Does the concept of safety culture help or hinder systems thinking in safety? *Accident Analysis and Prevention*, *68*(2014), 5–15. https://doi.org/10.1016/j.aap.2013.10.033

Rosario, E. R., Kaplan, S. E., Khonsari, S., & Patterson, D. (2014). Predicting and assessing fall risk in an acute inpatient rehabilitation facility. *Rehabilitation Nursing*, *39*, 86–93. https://doi.org/10.1002/rnj.114

Ross, M. K., Egan, E., Zaman, M., Aziz, B., Dewald, T., & Mohammed, S. (2012). Falls in the Inpatient Rehabilitation Facility. *Physical Medicine and Rehabilitation Clinics of North America*, *23*(2012), 305–314. https://doi.org/10.1016/j.pmr.2012.02.006

Roth, C., Brewer, M., & Wieck, L. (2016). Using a Delphi Method to Identify Human Factors Contributing to Nursing Errors. *Nursing Forum*, *52*(3), 173–179. https://doi.org/10.1111/nuf.12178

Salamon, L. A., Victory, M., & Bobay, K. (2012). Identification of patients at risk for falls in an inpatient rehabilitation program. *Rehabilitation Nursing*, *37*(6), 292–297. https://doi.org/10.1002/rnj.036

Schwendimann, R., Bühler, H., De Geest, S., & Milisen, K. (2006). Falls and consequent injuries in hospitalized patients: effects of an interdisciplinary falls prevention program. *BMC Health Services Research*, *6*(69), 1–7. https://doi.org/10.1186/1472-6963-6-69

Smith, J, Flowers, P., & Larkin, M. (2009). *Interpretive phenomenological analysis: Theory, method and research.* Thousand Oaks, CA: Sage.

Smith, Jonathan, Flowers, P., & Larkin, M. (2012). *Interpretive Phenomenological Analysis* (1st

ed.). London: Sage Publications.

Sorra, J, Gray, L., Streagle, S., & et al. (2016). Hospital Survey on Patient Safety Culture: User's Guide. *AHRQ Publication*. Retrieved from http://www.ahrq.gov/professionals/quality-patientsafety/patientsafetyculture/hospital/index.html

Sorra, Joann, & Dyer, N. (2010). Multilevel psychometric properties of the AHRQ hospital survey on patient safety culture. *Sorra and Dyer BMC Health Services Research*, *10*(199), 1–13. Retrieved from http://www.biomedcentral.com/1472-6963/10/199

Staggs, V. S., Davidson, J., Dunton, N., & Crosser, B. (2015). Challenges in Defining and Categorizing Falls on Diverse Unit Types. *Journal of Nursing Care Quality*, *30*(2), 106–112. https://doi.org/10.1097/NCQ.0000000000000085

Staggs, V. S., & Dunton, N. (2014). Associations between rates of unassisted inpatient falls and levels of registered and non-registered nurse staffing. *International Journal for Quality in Health Care*, *26*(1), 87–92. https://doi.org/10.1093/intqhc/mzt080

Stephenson, M., Mcarthur, A., Giles, K., Lockwood, C., Aromataris, E., & Pearson, A. (2016). Prevention of falls in acute hospital settings: A multi-site audit and best practice implementation project. *International Journal for Quality in Health Care*, *28*(1), 92–98. https://doi.org/10.1093/intqhc/mzv113

Su, H. C. (2017). The impact of mindful organizing on operational performance: An explorative study. *Operations Management Research*, *10*, 148–157. https://doi.org/10.1007/s12063-017-0128-1

Sutcliffe, K. M. (2011). High reliability organizations (HROs). *Best Practice and Research: Clinical Anaesthesiology*, *25*(2011), 133–144. https://doi.org/10.1016/j.bpa.2011.03.001

Sutcliffe, K. M., Paine, L., & Pronovost, P. J. (2017). Re-examining high reliability: Actively

organising for safety. *BMJ Quality and Safety*, *26*, 248–251. https://doi.org/10.1136/bmjqs-2015-004698

Tang, F. I., Sheu, S. J., Yu, S., Wei, I. L., & Chen, C. H. (2007). Nurses relate the contributing factors involved in medication errors. *Journal of Clinical Nursing*, *16*, 447–457. https://doi.org/10.1111/j.1365-2702.2005.01540.x

Teasell, R., McRae, M., Foley, N., & Bhardwaj, A. (2002). The incidence and consequences of falls in stroke patients during inpatient rehabilitation: Factors associated with high risk. *Archives of Physical Medicine and Rehabilitation*, *83*, 329–333. https://doi.org/10.1053/apmr.2002.29623

The Joint Commission. (2015). *Sentinel Event Alert, Issue 55: Preventing falls and fall-related injuries in health care facilities*. *Sentinel Event Alert*. Retrieved from www.jointcommission.org

The Joint Commission. (2017). *Sentinel Events*. *CAMH Update* (Vol. 1). Chicago.

Thomas, D., Pavic, A., Bisaccia, E., & Grotts, J. (2016). Validation of Fall Risk Assessment Specific to the Inpatient Rehabilitation Facility Setting. *Rehabilitation Nursing*, *41*, 253–259. https://doi.org/10.1002/rnj.211

Titler, M. G., Conlon, P., Reynolds, M. A., Ripley, R., Tsodikov, A., Wilson, D. S., & Montie, M. (2016). The effect of a translating research into practice intervention to promote use of evidence-based fall prevention interventions in hospitalized adults: A prospective pre–post implementation study in the U.S. *Applied Nursing Research*, *31*(2016), 52–59. https://doi.org/10.1016/j.apnr.2015.12.004

Tucker, A. L., & Edmondson, A. C. (2003). Why Hospitals Don't Learn from Failures: That Inhibit System Change. *California Management Review*, *45*(2), 45–72.

Tyler, D. A., & Parker, V. A. (2011). Nursing home culture, teamwork, and culture change. *Journal of Research in Nursing*, *16*(1), 37–49. https://doi.org/10.1177/1744987110366187

Tzeng, H. M., & Yin, C. Y. (2015). Perceived top 10 highly effective interventions to prevent adult inpatient fall injuries by specialty area: A multihospital nurse survey. *Applied Nursing Research*, *28*(1), 10–17. https://doi.org/10.1016/j.apnr.2014.04.005

Vogus, T. J., & Singer, S. J. (2016). Creating Highly Reliable Accountable Care Organizations. *Medical Care Research and Review*, *73*(6), 660–672. https://doi.org/10.1177/1077558716640413

Vogus, T. J., & Sutcliffe, K. M. (2007). The Impact of Safety Organizing, Trusted Leadership, and Care Pathways on Reported Medication Errors in Hospital Nursing Units. *@BULLETMed Care*, *4145*(78), 997–1002.

Vogus, T. J., Sutcliffe, K. M., & Weick, K. E. (2010). Doing No Harm: Enabling, Enacting, and Elaborating a Culture of Safety in Health Care. *Academy of Management Perspectives*, *24*(4), 60–77. https://doi.org/10.5465/AMP.2010.55206385

Wachter, R. M. (2013). Personal accountability in healthcare: searching for the right balance. *BMJ Qual Saf*, *22*, 176–182. https://doi.org/10.1136/bmjqs-2012-001227

Wang, X., Liu, K., You, L.-M., Xiang, J.-G., Hu, H.-G., Zhang, L.-F., … Zhu, X.-W. (2014). The relationship between patient safety culture and adverse events: A questionnaire survey. *International Journal of Nursing Studies*, *51*, 1114–1122. https://doi.org/10.1016/j.ijnurstu.2013.12.007

Watson, B., Salmoni, A., & Zecevic, A. (2018). Case Analysis of Factors Contributing to Patient Falls. *Clinical Nursing Research*, *00*(0), 1–20. https://doi.org/10.1177/1054773818754450

Weick, K. E. (2004). Normal accident theory as frame, link, and provocation. *Organization and*

Environment, *17*(1), 27–31. https://doi.org/10.1177/1086026603262031

Weick, K. E., & Sutcliffe, K. M. (2001). *Managing the Unexpected: Assuring High Performance in an Age of Complexity*. San Francisco: Jossey-Bass.

Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (1999). Organizing for High Reliability: Processes of Collective Mindfulness. In R. . Sutton & B. M. Staw (Eds.), *Research in Organizational Behavior* (Vol. 1, pp. 81–123). Stanford: Jai Press.

Weil, T. P. (2015). Patient falls in hospitals: An increasing problem. *Geriatric Nursing*, *36*(2015), 342–347. https://doi.org/10.1016/j.gerinurse.2015.07.004

Weiner, L. (2017). Efficient staffing doesn' t mean heartless care. *Healthcare Leadership Review*, *36*(6), 10–12.

Wobbe, R. R. (1978). Primary Versus Team Nursing.pdf. *Supervisor Nurse*, *9*(3), 34–39.

Zecevic, A., Ho-ting, A., Ngo, C., Halligan, M., & Kothari, A. (2017). Improving safety culture in hospitals: Facilitators and barriers to implementation of Systemic Falls Investigative Method (SFIM). *International Journal for Quality in Health Care*, *29*(3), 371–377. https://doi.org/10.1093/intqhc/mzx034

Appendix A

A review of the literature spanning the period from January 2000 to July 2017 was undertaken to identify research associated with patient safety culture and fall prevention using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (http://prisma-statement.org/). The databases searched include Medical Literature Analysis and Retrieval System Online (Medline), Cumulative Index of Nursing and Allied Health Literature (CINAHL), Education Resource Information Center (ERIC), Elton B. Stephens Co. (EBSCO), Google Scholar, and Virginia Commonwealth University (VCU) library. For this research study, a systematic literature search was conducted using Medical Subject Heading (MeSH) terms such as "patient safety", "patient falls", "accidental falls", "patient safety and falls", "safety culture", "accidental falls and safety culture", "patient safety culture and falls", "prevent falls in hospitals", "psychological safety", "nurse compliance with protocol", "fall prevention", "high reliability organization", and "safety organizing". Some works of literature are before the Institute of Medicine report (Kohn, L., Corrigan, J., Donaldson, 2000) but the findings by these researchers are still relevant to the current study.

Summary of Literature Review

Authors	Aim	Design Type	Outcome Measure (DV)	Independent Variables (IV)	Result	Setting
Ang, Mordiffi, Wong (2011)	To examine the effectiveness of a strategy using targeted multiple interventions in reducing the number of patients falls in an acute care hospital	Randomized controlled trial	Incidences of fall	Multiple interventions	Targeted multiple interventions were effective in reducing the incidences of fall.	Acute care hospital, Singapore
Barker, Morello, Wolfe, Brand, Haines, Hill, Brauer, Botti, Cummings, Livingston, Sherrington, Avarsek, Lindley, Kamar (2015)	To evaluate the effect of the 6-PACK program on falls and falls with injuries in acute wards.	Cluster randomized controlled trial	Falls and falls with injuries per 1000 occupied patient days	6-pack programme or usual care	No difference in falls rate between units using 6-pack program versus units with usual intervention	Six acute care Australian hospitals, Australia
Black, Brauer, Bell,	To explore the perception of	Quantitative cross-	Scores for overall	Safety climate	Positive safety climate	Acute and subacute

Authors	Aim	Design Type	Outcome Measure (DV)	Independent Variables (IV)	Result	Setting
Economidis, Haines (2011)	safety climate among frontline staff and their attitude towards fall prevention	sectional study design	safety climate	dimensions: leadership, teamwork, training, organizational resources, fear of repercussions, provision of safe care	responses include "provision of safe care", "unit recognition and support for safety efforts". Teamwork is identified as an important factor for fall prevention.	units at two metropolitan hospitals, Australia
Bonner, Castle, Men, & Handler (2009)	To examine whether there is a correlation between the perception of patient safety culture by certified nursing assistants (CNA) and clinical outcomes	Cross-sectional study design. Secondary data analysis using AHRQ patient safety culture survey and Minimum Data Set (MDS), Online Survey Certification and Reporting (OSCAR) system and Area Resource File (ARF)	Fall rate, pressure ulcer rate, daily restraint use	Patient safety culture score	Higher patient safety culture scores correlate with lower adverse events	Skilled nursing facilities, United States
Bunn, Dickinson, Barnett-Page, McInnes, Horton (2008)	To review research evidence on barriers and facilitators which influence older people's participation in and adherence to fall prevention programs and interventions.	A systematic review of studies of older people's perceptions of fall prevention.	Attitude towards participation in fall prevention programs	Gender, ethnicity	Gender and ethnicity may affect attitudes towards and participation in fall prevention programs.	All settings including hospital, home, emergency department, United Kingdom
Castel, Ginsburg,	To identify and understand	Cross-sectional	Fear of repercussion	Age, gender, tenure,	Age, gender, tenure, teaching	Acute care, Canada

Authors	Aim	Design Type	Outcome Measure (DV)	Independent Variables (IV)	Result	Setting
Zaheer, & Tamim, (2015)	factors influencing fear of repercussion when reporting and discussing medical errors.	analysis of a modified Stanford patient safety culture survey		teaching status and province	status, and province are not significantly associated with repercussions	
Clancy & Mahler (2016)	To explore the perception of nursing staff on safety promotion and fall prevention in assisted living centers.	Qualitative study – hermeneutic phenomenol ogical design	none	Based on the themes from interviews. Interviews were conducted based on the ethics of care and vulnerability within a lifeworld approach	Staffs are more focused on protection and prevention rather than safety promotion and well-being.	Assisted living centers, Norway
Hempel, Newberry, Wang, Booth Shanman, Johnsen, Shier, Saliba, Spector, Ganz (2013)	A systematic review to compare implementatio n, components, comparators, adherence, and effectiveness of fall prevention approaches.	Systematic review	Incidence rate ratios	Types of fall prevention interventions	Interventions include staff education, leadership support, quality improvement	Acute care hospitals, United States
Hicks (2015)	To determine if hourly rounding can prevent patient falls in acute care settings	Integrative literature review	Number of fall incidences	Hourly Rounding	Most have found a reduction of fall incidences after implementing hourly rounding.	Acute care hospitals, United States
Koh, Manias, Hutchinson, Donath, Johnston (2008)	To assess the perceived barriers to practice change by eliciting nurses' opinions about barriers to, and facilitators of, implementatio n of a fall prevention clinical practice guidelines	A quantitative survey using validated questionnair es titled "barriers and facilitators developed in the Netherlands.	Implementat ion of fall prevention clinical practice guidelines	Knowledge and motivation, availability of support staff, access to facilities, the health status of patients, education of staff and patients	The greatest barriers to implementation of clinical practice guidelines for fall prevention were: knowledge and motivation, availability of support staff, access to facilities, the health status of patients, and	Acute care hospitals Singapore

Authors	Aim	Design Type	Outcome Measure (DV)	Independent Variables (IV)	Result	Setting
					education of staff and patients.	
Miake-Lye, Hempel, Gan, Shekelle (2013)	A systematic review to evaluate the benefits and harms of fall prevention programs and the effectiveness of implementation.	Systematic review	Not applicable	Not applicable	Interventions include multifactorial interventions which include risk assessments, education for patients and staff, alert signage, non-slip footwear, supervised toileting, and medication review. Factors affecting successful implementation include leadership support, engagement of front-line staff, pilot testing of implementation, a multidisciplinary committee, and changing the attitude about falls.	Global
Morello, Barker, Ayton, Landgren, Kamar, Hill, Brand, Sherrington, Wolfe, Rifat, Stoelwinder (2011)	To examine the implementation fidelity of the 6-PACK program for fall prevention.	Cross-sectional study and chart review to quantify adherence to program components and organizational support.	Compliance with the implementation of 6-pack program intervention	Interventions used in the 6-Pack program.	Fall risk tool was completed each day for 79% of patients. Of the 38% of patients classified as high fall risk, 79% had falls alert sign and 63% implemented at least one of the 6-PACK interventions.	Acute care hospitals, Australia
Ohde, Terai, Oizumi, Takahashi, Deshpande, Takekata, Ishikawa,	To examine if staff compliance affects the effectiveness of	Observational study	Staff compliance with fall prevention protocol	Multifactorial interventions such as fall risk assessment,	Staff compliance with implementing fall prevention protocol increased from	Tokyo, Japan

Authors	Aim	Design Type	Outcome Measure (DV)	Independent Variables (IV)	Result	Setting
Fukui (2012)	multidisciplinary QI activity				85.9% in 2007 to 95.3% in 2010.	
Roth, Brewer, & Wieck, (2016)	To investigate if nursing errors were caused by human factors.	Delphi technique qualitative survey questionnaire followed by summarizing results with feedback and confirmation	Common causes of nursing errors	Human factors affecting medical errors such as fatigue, heavy workload, lack of critical thinking, impairment due to substance abuse, training, lack of resources	Established consensus and developed a platform upon which future study of nursing errors can evolve as a link to future solutions	A panel of nurse experts, United States
Schwendimann, Bühler, De Geest, & Milisen, (2006)	To examine inpatient fall rats and consequent injuries before and after the implementation of an interdisciplinary fall prevention program (IFP) in a 300-bed urban public hospital	Observational study using a serial survey design	Number of falls and the number of falls with injuries	Implementation of IFP	There is no difference in frequencies of falls or consequent injuries post implementation of IFP.	300-bed urban public hospital, Switzerland
Shah, Castro-Sanchez, Charani, Drumright, Holmes (2015)	To identify HCW's behaviors towards handwashing	Qualitative interviews	Compliance with infection control practices	Attribution of responsibility, prioritization of work and appraisal of risk, the hierarchy of influence	Behaviors are based on normative practices, individual preferences, professional isolation	Acute care hospital, United Kingdom
Stephenson, McArthur, Giles, Lockwood, Aromataris, Pearson (2015)	To assess falls prevention practices and implement an intervention to promote best practice.	Observational, multi-site chart audit	Percent compliance with fall prevention	Multi-component fall prevention interventions. Moderator variable – education	Overall compliance has improved after introducing interventions (staff and patient education)	Acute care hospitals, public and private hospital, Australia
Tzeng, Yin (2015)	To identify the top 10 highly effective	Cross-sectional nurse survey	Top ten highly effective	Assess and modify the environment,	Top ten highly effective interventions for	Acute care hospitals

Authors	Aim	Design Type	Outcome Measure (DV)	Independent Variables (IV)	Result	Setting
	interventions to prevent fall injuries in adult inpatients based on the perceptions of		intervention s for preventing injurious falls by each specialty area.	keep the floor clean and dry, wear non-slip footwear, use of sitter, reduce clutter, reduce tripping hazards, keep equipment out of pathway, call light within reach, fall risk assessment completion, etc	preventing injurious falls by each specialty area were listed for each specialty such as medical, surgical, telemetry, oncology, orthopedics, cardiac, behavioral health, women's health and rehabilitation.	United States
Wang, Liu, You, Xiang, Hu, Zhang, Zheng, Zhu (2014)	To examine the relationship between nurses' perception of patient safety culture and the frequencies of an adverse event.	A cross-sectional study design with descriptive statistics and correlation studies	Outcome measures for the adverse events such as medication error, pressure ulcer, patient falls, physical restraints, surgical wound infection, transfusion reaction, patient and family complaints	AHRQ patient safety dimensions: Organizationa l learning, teamwork, supervisor action, feedback and communicati on, handoffs, management support, the overall perception of safety, teamwork across units, the frequency of event reporting, communicati on openness, non-punitive response to error, staffing and overall.	Organizational learning is significantly related to lower occurrence of pressure ulcers, prolonged physical restraints, and complaints. "Frequency of event reported" correlates with lower medication error report rate and pressure ulcers.	Inpatient and Emergency departments, China
Zecevic, Ho-Ting, Ngo, Halligan, Kothari (2017)	To assess the facilitators and barriers to implementatio n of the Systemic Falls Investigative	Qualitative analysis using focus groups – patients who fell, family members,	Percent of positive responses on the Modified Stanford Patient Safety	Themes that emerge from interviews and focus groups	Facilitators were hospital accreditation, a strong emphasis on patient safety, infrastructure, and dedicated	Geriatric rehabilitatio n unit of an acute care hospital and neurological unit of rehab

Authors	Aim	Design Type	Outcome Measure (DV)	Independent Variables (IV)	Result	Setting
	Method (SFIM)	staff and hospital management	Culture Survey		champions. Barriers were heavy workloads, lack of time, lack of resources, and poor communication	hospital, Canada

Appendix B

Sample Email Recruitment Script

Dear [insert name]:

I am currently in a PhD program at Virginia Commonwealth University conducting research on patient falls. You may know me already as director of quality at Sheltering Arms, but I am writing to you today using my role as a student in the PhD program and inviting you to participate in my research study about prevention of patient falls. I would like to explore your thoughts and perceptions about the fall prevention program and how you and your team members work together to prevent a fall. You are eligible to be in this study because you are one of the frontline staff taking care of patients who are at risk for falls. I obtained your contact information from [describe source].

If you decide to participate in this study, you will be interviewed for 60 to 90 minutes about fall prevention and patient safety culture. I would like to audiotape the interview so that I can capture our conversation and transcribe them for further analysis. As an appreciation for your time and participation, you will be provided with a $20 gift card.

Your participation will be kept confidential and de-identified using pseudonyms. Remember, this is completely voluntary. You can choose to be in the study or not. If you would like to participate or have any questions about the study, please email or contact me at 804-764-5290 by xx-xx-2018.

Thank you very much.

Sincerely,
Kate Lim

kslim@mymail.vcu.edu
klim@shelteringarms.com

Appendix C

RESEARCH PARTICIPANT INFORMATION AND CONSENT FORM

STUDY TITLE: Getting to Zero Preventable Fall: An Exploratory Study

VCU INVESTIGATORS: Cheryl Rathert, PhD, Kate Lim, PhD student

ABOUT THIS CONSENT FORM

You are being invited to participate in a research study. It is important that you carefully think about whether being in this study is right for you and your situation. Please ask the investigator or the study staff to explain any information in this consent document that is not clear to you.

Your participation is voluntary. You may decide to not participate in this study. If you do participate, you may withdraw from the study at any time. Your decision not to take part or to withdraw will involve no penalty or loss of benefits to which you are otherwise entitled.

AN OVERVIEW OF THE STUDY AND KEY INFORMATION

The purpose of this study is to explore whether patient safety culture influences fall prevention. We want to learn how the workplace environment affects the experiences of individuals when caring for patients with high risk for falls in a rehab setting.

In this study, you will be asked to attend an interview session lasting 60-90 minutes during which you will be asked questions about your thoughts on patient safety culture and your experiences working with patients who are at risk for falls. The investigators will also collect the following demographic information from you: your profession, gender, the hospital you work in, educational level, number of years in your profession, and number of years working in rehab setting.

With your permission, the interview will be audio taped and transcribed for the purpose of capturing and maintaining an accurate record of the discussion. Your name will not be used at all. On all transcripts and data collected you will be referred to only by way of a code number.

There are both risks and benefits of participating in research studies.

Most Common Risks and Discomforts	Benefits to You and Others
Participation in research might involve some loss of privacy. There is a small risk that someone outside the study could see and misuse information about you.	This study is not likely to help you. However, it may help the investigators understand how to administer intervention strategies to mitigate the risk of patient falls.

The interview questions asking about your workplace and experiences may make you feel uncomfortable or upset.	

In general, we will not give you any individual results from the study. However, you will be provided with verbatim transcriptions and written interpretations of the interview so that you can check for accuracy.

WILL I BE PAID TO PARTICIPATE IN THE STUDY?

You will be paid $20 by gift card for participating in the interview.

HOW WILL INFORMATION ABOUT ME BE PROTECTED?

VCU and the VCU Health System have established secure research databases and computer systems to store information and to help with monitoring and oversight of research. Your information may be kept in these databases but are only accessible to individuals working on this study or authorized individuals who have access for specific research related tasks.

Identifiable information in these databases are not released outside VCU unless stated in this consent or required by law. Although results of this research may be presented at meetings or in publications, identifiable personal information about participants will not be disclosed.

Personal information about you might be shared with or copied by authorized representatives from the following organizations for the purposes of managing, monitoring and overseeing this study: Representatives of VCU and the VCU Health System and officials of the Department of Health and Human Services.

In the future, identifiers might be removed from the information you provide in this study, and after that removal, the information could be used for other research studies by this study team or another researcher without asking you for additional consent.

During the interview, if there is any information uncovered that is reportable due to law and regulations, the researcher will have to report the information to the leadership of your organization. Reportable events include adverse events that had occurred while a patient was under the care of the hospital such as a fall incident with or without injury, medication error, and blood transfusion errors.

WHO SHOULD I CONTACT IF I HAVE QUESTIONS ABOUT THE STUDY?

If you have any questions, complaints, or concerns about your participation in this research, contact:

Cheryl Rathert, PhD, VCU Principal Investigator
VCU Department of Health Administration
Email: crathert@vcu.edu

and/or
Kate Lim, PhD student and researcher
Email: kslim@vcu.edu
Telephone: (804) 937-0017

The researcher/study staff named above is the best person to call for questions about your participation in this study.

If you have general questions about your rights as a participant in this or any other research, you may contact: Virginia Commonwealth University Office of Research, 800 East Leigh Street, Suite 3000, Box 980568, Richmond, VA 23298, Telephone: (804) 827-2157.

Contact this number to ask general questions, to obtain information or offer input, and to express concerns or complaints about research. You may also call this number if you cannot reach the research team or if you wish to talk to someone else. General information about participation in research studies can also be found at http://www.research.vcu.edu/irb/volunteers.htm.

Do not sign this consent form unless you have had a chance to ask questions and have received satisfactory answers to all of your questions.

STATEMENT OF CONSENT

I have been provided with an opportunity to read this consent form carefully. All of the questions that I wish to raise concerning this study have been answered. By signing this consent form, I have not waived any of the legal rights or benefits to which I otherwise would be entitled. My signature indicates that I freely consent to participate in this research study. I will receive a copy of the consent form for my records.

Signature Block for Enrolling Adult Participants	
_____ Adult Participant Name (Printed)	
_____ Adult Participant's Signature	_____ Date
_____ Name of Person Conducting Consent Discussion (Printed)	
_____ Signature of Person Conducting Consent Discussion	_____ Date
_____ Principal Investigator Signature (if different from above)	_____ Date

Appendix D

DEMOGRAPHICS FORM

Next, please fill out this form so that I can gather some demographic information about you (profession, gender, the hospital you work in, educational level, number of years in your profession, and number of years working in rehab setting).

Demographic information (please check off relevant answer or write in):

Your Profession:

- ☐ RN
- ☐ LPN
- ☐ Nursing Tech / Patient Care Partner
- ☐ PT
- ☐ OT
- ☐ Rehab Tech

Gender:

- ☐ Male
- ☐ Female

Hospital you work in:

- ☐ [Hospital A]
- ☐ [Hospital B]
- ☐ [Hospital C]

Educational Level:

- ☐ High School
- ☐ Associate Degree
- ☐ Bachelor Degree
- ☐ Master Degree
- ☐ Doctorate Degree

Number of Years in Your Profession:

- ☐ _____

Number of Years Working in a Rehab Setting:

- ☐ _____

Number of Years Working in Your Organization:

- ☐ _____

Appendix E

INTERVIEW GUIDE

Patent Safety Culture and Fall Prevention Interview Questions for Frontline Staff

Date

INTRODUCTION AND RULES
STRESSING CONFIDENTIALITY AND THE NEED FOR OPENNESS
[Note that this section is not recorded to protect participant's confidentiality.]

Hi xxx, my name is Kate Lim, and I am the director of quality at Sheltering Arms, but for this interview today, I am wearing the hat of a researcher conducting a study for my doctoral research. It may seem a bit odd to you as we have interacted on many occasions but I want to assure you that I am not here today wearing my usual work hat, so please do not hesitate to speak your mind as it will all be kept confidential. First of all, thank you for participating in this interview and for taking some time out of your workday to be with me.

My role is to facilitate the discussion. I respect your privacy and will keep the content of our discussion confidential. For me to capture the conversation and type them up later, I need to obtain consent from you to record this session to keep an accurate record of what is said. I will transcribe the recording and then delete the original recording. If you are uncomfortable with the recording, please let me know now. If you are agreeable to this process, please read this consent information form and let me know if you agree or disagree with it. [Pause to allow time to read and sign and answer any questions related to the consent form.]

Next, please fill out this form so that I can gather some demographic information about you (profession, license, gender, the hospital you work in, educational level, number of years in your profession, and number of years working in rehab setting). This will help me in analyzing the data. As a reminder, I will be presenting this information in a way that your risk of being identified based on your demographics is minimal.

WARM-UP AND FAMILIARITY (5 min.- cumulative 10 min.)

Our discussion topic today is about patient safety culture and how it affects fall prevention. I would like to gather your thoughts and opinions on how the culture of your organization affects your ability to prevent falls. So, we will spend about one hour together to gather your thoughts and opinions about features in your organization's patient safety culture and how it affects your fall prevention program. Patient safety culture refers to the values, attitudes, perceptions, and patterns of behavior that you and your team members embrace as the style and proficiency in your workplace.

You may see me taking notes. I am doing this to help me remember and interpret what is said today, but I will not include any information that will personally identify you in the notes. Each participant is given a unique code to allow me to trace back to the person but this code is kept by me only. The information collected today will be used to help the research team identify the factors affecting the effectiveness of fall prevention program. However, note that if there is any information that is reportable due to law and regulations, I will have to escalate the information to your leaders.

[Note that the above section is not recorded to protect participant's confidentiality.]

Being recording

Let's start. As stated earlier, it is important that we hear your perspective as we proceed with this interview. There are no "right" or "wrong" answers to the questions but feel free to ask me to clarify our question if you do not understand.

RESPONDENT PERSPECTIVES (10 min – cumulative 20 min)

1. First, let's talk about preventable and non-preventable falls. Based on your experience, how do you define preventable and non-preventable falls?
2. Thank you, next I would like to learn from you what you already know about your program on fall prevention. Describe for me your experience with fall prevention programs. [*to ascertain if there is an existing shared values and beliefs (patient safety culture) in the fall prevention program*]
3. How do you feel fall prevention programs are being implemented?

BARRIERS AND FACILITATORS (35 min – cumulative 50 min)

Now, for this next segment of our discussion, we are going to focus on specific experiences you have had at your organization. They may have been good experiences or bad. It doesn't matter. I don't want you to feel uncomfortable. So if you are uneasy about mentioning specific examples, just talk around them. Also, names of colleagues, leaders or physicians are not pertinent to our discussion, so it's not necessary to mention them.

1. Now that we have talked about fall prevention programs, in your view, what are the main challenges for preventing and managing patients with high fall risk at your organization? [*to explore the special challenges that frontline staff in an IRF setting face when taking care of high fall risk patients*]

   Probe: If any, what are the barriers that may prevent you from following the fall prevention protocol? Personal barriers? Organizational barriers?

   Probe: What do you value as the strengths of your organizations' fall prevention protocol?

2. What would facilitate you and your colleagues in ensuring preventive steps are taken for all patients who are at risk for falls? [to explore the definition of patient safety culture through the lens of frontline staff]

Probe: Do you feel anything ought to be changed in the protocol? If you do, what do you propose the changes to be?

3. What factors, if any, would make it easier for you to prevent patient falls? Can you think of specific examples? [*to identify the factors perceived by frontline staff that have impeded or continue to hamper their ability to prevent falls*]

Probe: How would your attitude change dependent on what aspect of fall prevention it is? (e.g., wheelchair belt must be worn when in wheelchair, bed alarm on, toileting, hourly rounding)

4. Based on your earlier description of fall prevention program and how the program is implemented, how would you describe your organization's patient safety culture or the shared values and beliefs amongst your colleagues?

Probe: Is it easy or difficult to adhere to the fall prevention protocol? Why? How often do your colleagues comply with the fall prevention protocol? How do you feel about encouraging your coworkers to comply with fall prevention practices? Can you think of an example?

Probe: If you have to coach your colleague in fall prevention, would your approach change when addressing with different colleagues such as peers, seniors, juniors, another professional group, physician, manager, chief nursing officer? If so, how would it change?

MANAGEMENT SUPPORT AND TEAMWORK (10 min – cumulative 60 min)

1 What are some suggestions on how the organization can support your efforts to prevent falls or any patient safety initiative?

Probe: When you bring issues to management, what kind of feedback do you get?

Probe: If the issue involves physician(s), whom do you tell?

Probe: If the issue involves another department, whom do you tell?

2. What recommendations do you have for management to successfully integrate patient safety culture into your workplace?

Are there any questions that we can answer for you about this project?

Is there anything you would like to add to previous questions?

Thank you very much for your time and here is a $20 gift card as a token of my appreciation.

I will be sending you an email to review the transcript. Please let me know if you have questions and here is my business card for you to contact me at any time. Thanks!

Appendix F`

Dear XXX:

During our previous discussions, I mentioned my dissertation research in my role as a PhD student in Health Related Science – Health Administration track at Virginia Commonwealth University. My dissertation study, **Getting to Zero Preventable Falls: An Exploratory Study,** examines the impact of a safety culture on patient fall prevention. This correspondence is my formal request for your permission to conduct this research at Sheltering Arms Rehabilitation Hospital [or Virginia Commonwealth University Health rehabilitation unit].

I am requesting your permission to interview frontline staff members who are involved in caring for patients who are at risk for falls (i.e., nurses, nursing technicians, care partners, physical therapists, occupational therapists, rehabilitation technicians). The estimated number of participants that I plan to recruit is 21. The interview process will take 60 minutes or less, and will be scheduled to not interfere with participants' current job obligations. Interviews will be conducted in a hospital conference room to ensure minimal disruption to participants' work schedules. All individual interview responses are confidential. Employees who agree to participate in interviews will be briefed on the purpose of the research and asked to sign a consent form, They will receive a $20 gift card in appreciation of their time.

The interview results will be pooled for the dissertation project. The final results will be shared with you at study completion. When the completed study is published as a dissertation, only pooled results will be documented. Additionally, the published dissertation and any subsequent academic products derived from it will not disclose the names of the hospitals and locations whose employees participated in the interview process.

Your approval to conduct this study will be greatly appreciated. If you agree, kindly sign the approval below. I will provide you with a copy that reflects my acknowledgment of your agreement and support. If you have further questions, please do not hesitate to contact me via email or in person. Thank you.

Sincerely,

Kate Lim (kslim@mymail.vcu.edu or klim@shelteringarms.com)

I, _____[name]_____, ____[title]____, hereby approve Kate Lim to conduct a research study **Getting to Zero Preventable Falls: An Exploratory Study** at my organization. I have read this letter and understand its intent.

_____ _____

Signature Date

Name: _____

Title: _____

I, Kate Lim, PhD student, hereby acknowledge receipt of this approval letter and a copy is given to the above signee.

_____ _____

Signature Date

Appendix G

Bracketing Interview Questions

The purpose of this "bracketing interview" is to explore the impact of the researcher's personal and professional experiences during data collection and analysis.

1. Describe for me your experience with fall prevention programs.
2. What is your role in patient safety?
3. Why are you passionate about this topic of patient safety culture and fall prevention?
4. What do you think are the barriers and facilitators to fall prevention?
5. How do you view the employees' perception of patient safety culture?
6. In your view, how can an organization successfully integrate patient safety culture into the workplace?

Appendix H

Table of Codes and Groupings

This table shows the different codes and how they are grouped. Groundedness refers to the number of times the theme is coded.

Name	Groundedness	Groups
Approach - being helpful	5	Approach - culture
Approach - depends on who it is	1	Approach - culture
Approach - non-confrontational	4	Approach - culture
Approach - reminding them of safety	2	Approach - culture
Approach - take over	3	Approach - culture
Approach - through coaching and demonstrating	5	Approach - culture
Approach - through leadership	1	Approach - culture
Approach - through peer coaching	8	Approach - culture
Barrier - all patients are high fall risk	2	Barriers
Barrier - constant signage makes them ignore message	1	Barriers
Barrier - delay in response	5	Barriers
Barrier - equipment accesibility of the lift device	8	Barriers
Barrier - geographic location of patients	2	Barriers
Barrier - inconsistency of practice	6	Barriers
Barrier - ineffective communication via email	4	Barriers
Barrier - inexperienced nurses who are still learning	4	Barriers
Barrier - insufficient toileting rounds	3	Barriers
Barrier - Lack of hardwired process	6	Barriers
Barrier - lack of personal ownership	9	Barriers
Barrier - Lack of teamwork	1	Barriers
Barrier - Limitation of night shift - lack of interaction with other disciplines	1	Barriers
Barrier - multitasking causes inconsistency	13	Barriers
Barrier - Nurses too task-oriented	2	Barriers
Barrier - patient medication	1	Barriers
Barrier - Patient non-compliant	7	Barriers
Barrier - patient's physiological condition affecting their cognition and safety awareness	5	Barriers
Barrier - personal distractions	1	Barriers

Name	Groundedness	Groups
Barrier - personal health	2	Barriers
Barrier - personalities differences	3	Barriers
Barrier - physical space design of patient room, confined space	5	Barriers
Barrier - staff feeling overwhelmed, burned out	5	Barriers
Barrier - staffing issues	19	Barriers
Barrier - using restraint for convenience	1	Barriers
Communication method - email is not effective	1	Communication Methods
Communication method - face-to-face	2	Communication Methods
Communication method - IPASS in electronic medical record is helpful	3	Communication Methods
Communication method - standardized format using a form for nursing	1	Communication Methods
Culture - bureaucratic	1	Culture of Organization
Culture - caring	1	Culture of Organization
Culture - collaborate with each other for patient safety	14	Culture of Organization
Culture - consistency in practice	5	Culture of Organization
Culture - empowered to speak up for safety	1	Culture of Organization
Culture - good communication	7	Culture of Organization
Culture - joint interdisciplinary	5	Culture of Organization
Culture - learning from each other	1	Culture of Organization
Culture - not as much interaction with night shift	1	Culture of Organization
Culture - Personal accountability for patient safety	2	Culture of Organization
Culture - safety as first priority	13	Culture of Organization
Culture - safety can be affected by personality conflicts	3	Culture of Organization
Culture - safety can be compromised due to staffing shortage	1	Culture of Organization
Culture - transparency in patient safety issues	2	Culture of Organization
Culture - well-trained staff	1	Culture of

Name	Groundedness	Groups
		Organization
Facilitator - consistent staffing based on geographic region	4	Facilitator
Facilitator - equipment adequate and available	8	Facilitator
Facilitator - good communication	17	Facilitator
Facilitator - good safe lift program	2	Facilitator
Facilitator - good teamwork	14	Facilitator
Facilitator - lead by example	1	Facilitator
Facilitator - non-punitive response to errors	2	Facilitator
Facilitator - ongoing education	7	Facilitator
Facilitator - open space in gym allows interaction	1	Facilitator
Facilitator - personal accountability	5	Facilitator
Facilitator - physical - clear and low lighting for low stimulation for aggravated patients	1	Facilitator
Facilitator - safety huddle to make safety first priority	5	Facilitator
Facilitator - standardized protocol	6	Facilitator
Factor - Awareness of patient types in rehab increases vigilance	1	IRF patients
Factor - intensive therapy causing lethargy	1	IRF patients
Factor - long length of stay of patients	1	IRF patients
Factor - patients with catheters removed have more need to go to bathroom	1	IRF patients
Fall Assessment	8	Fall Risk Assessment
Inadequate handoff due to being busy	1	Inadequate handoff
Inadequate handoff due to lack of communication	1	Inadequate handoff
Inadequate handoff due to not seeing the need to handoff	1	Inadequate handoff
Interdisciplinary relationship - collaborative and cross sharing ideas	2	Interdisciplinary relationship
Interdisciplinary relationship - conflicting opinions	1	Interdisciplinary relationship
Interdisciplinary relationship - confrontational	1	Interdisciplinary relationship
Interdisciplinary relationship - depends on good communication	5	Interdisciplinary relationship
Interdisciplinary relationship - depends on personalities	4	Interdisciplinary relationship
interdisciplinary relationship - different focus	1	Interdisciplinary relationship
Interdisciplinary relationship - different psychology	1	Interdisciplinary relationship

Name	Groundedness	Groups
Interdisciplinary relationship - different schools of thought and training	1	Interdisciplinary relationship
Interdisciplinary relationship - good collaboration	5	Interdisciplinary relationship
Interdisciplinary relationship - good relations	4	Interdisciplinary relationship
Interdisciplinary relationship - lack participation from nursing due to busy schedule	1	Interdisciplinary relationship
Leaders are available when needed	7	Leaders
Leaders are not visible	6	Leaders
Leaders are supportive	9	Leaders
Leaders are visible and available	5	Leaders
Leaders have open line of communication	5	Leaders
Leaders not holding staff accountable	4	Leaders
Leaders support patient safety	8	Leaders
Leaders to acknowledge staffing issues	4	Leaders
Leaders to provide more education	2	Leaders
Leaders trust them	2	Leaders
Not preventable - accidental	2	Not preventable
Not preventable - non-compliant patient or family	5	Not preventable
Not preventable - patient's mental and cognitive impairment	8	Not preventable
Not preventable - uncontrollable	13	Not preventable
Not preventable - unpredictable	6	Not preventable
Preventable - did not put safety measures in place	21	Preventable
Preventable - educate family and patient	2	Preventable
Preventable - environmental issues	2	Preventable
Preventable - lack of experience	2	Preventable
Preventable - lack of good handoff communication	1	Preventable
Preventable - possessions not within reach	1	Preventable
Preventable - rounding and checking not done frequently	2	Preventable
Preventable - unsafe transfer	2	Preventable
Role of nurse - access to IV	1	Role of Nurse
Role of nurse - all things to all people	4	Role of Nurse
Role of nurse - bowel and bladder functional status	1	Role of Nurse
Role of nurse - cognition status of patient	1	Role of Nurse
Role of nurse - educating patients	2	Role of Nurse
Role of nurse - medication	3	Role of Nurse
Role of nurse - nutrition intake and output	1	Role of Nurse
Role of nurse - pain management	1	Role of Nurse
Role of nurse - patient advocate	1	Role of Nurse
Role of nurse - physical, emotional, and social needs	2	Role of Nurse
Role of nurse - toileting	1	Role of Nurse

Name	Groundedness	Groups
Role of nurse - update on functional independent measures such as bowel, bladder, continent status, catheter use	1	Role of Nurse
Role of nurse - wound care	2	Role of Nurse
Role of nurse tech - vital signs, toileting, transfers, relaying information to nurses	5	Role of Nurse Assistant
Role of occupational therapist - teach patients self-care skills	4	Role of Occupational Therapist
Role of physical therapist - assess functional abilities such as walking stairs and wheelchairs	3	Role of Physical Therapist
Role of physical therapist - expert in balance and mobility	1	Role of Physical Therapist
Role of physical therapist - expert in transferring patient	3	Role of Physical Therapist
Role of physical therapist - ordering durable medical equipment	1	Role of Physical Therapist
Role of rehab tech - assist therapists in taking care of patients	2	Role of Rehab Assistant
Staffing - adding ancillary staff	1	Staffing
Staffing - adjust by acuity	3	Staffing
Staffing - adjust by workload	3	Staffing
Staffing - based on patient's functional capacity	1	Staffing
Staffing - juggling multiple priorities	2	Staffing
Staffing - nursing model (primary vs team)	2	Staffing
Staffing - understaffed, overworked	1	Staffing
Staffing - unscheduled absences causing lack of manpower	2	Staffing
Suggestion - communication - improve cross-discipline communication	14	Suggestion
Suggestion - education - cross discipline collaboration for patient safety	4	Suggestion
Suggestion - education - crosstrain nursing staff	3	Suggestion
Suggestion - education family training on fall prevention	1	Suggestion
Suggestion - education more focus on fall prevention during orientation	3	Suggestion
Suggestion - education through peer coaching	4	Suggestion
Suggestion - enhance teamwork	4	Suggestion
Suggestion - leadership - add staffing during shift change	3	Suggestion
Suggestion - leadership - Celebrate successes	6	Suggestion
Suggestion - leadership - engage frontline staff to provide input	3	Suggestion
Suggestion - Personal reflection to internalize error	1	Suggestion

Name	Groundedness	Groups
Suggestion - process consistency in practice of preventive measures	10	Suggestion

Vita

Kate Lim Bradshaw was born on November 2, 1968, in Batu Pahat, Johor, Malaysia and is an American citizen. She graduated from Anglo Chinese Junior College, Singapore in 1988. She received her Bachelor of Science in Medical Technology from Virginia Commonwealth University, Richmond, Virginia in 1992. She received her Master in Health Administration from Virginia Commonwealth University in 1998. She also completed an Executive Fellowship in Patient Safety (2003) and an Executive Fellowship in Health Law (2005) from Virginia Commonwealth University. Kate has been a Fellow in the American College of Healthcare Executives since 2005. Her career spans from Clinical Laboratory Science to Healthcare Management. For the past 20 years, she has served in the role of Director of Quality Management and Risk Management in various health systems including Sentara Healthcare, Penang Adventist Hospital, Bon Secours Health System, Sheltering Arms Physical Rehabilitation Centers, HCA, and Riverside Health System. Currently, she is the Director of Quality, Risk, and Case Management at Sheltering Arms Physical Rehabilitation Hospitals. Her research areas of interest include patient safety, quality improvement, regulatory compliance, operational efficiencies, and health equity.